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March, 1931

"Let There Be Sight"

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The Sight-Saving Review

Volume I Number 1

March, 1931

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DR. ERNST FUCHS

Ernst Fuchs, 1851–1930—An Appreciation

William Henry Luedde, M.D.

A GIANT of science, Dr. Fuchs left behind an immortal name so closely linked to prevention of blindness that one cannot think of "eyes" without thought of "Fuchs." For more than half a century he gave unstinted labor to his profession. The respect aroused by this beloved humanitarian is movingly presented here.

CARRYING his torch high, our great leader hath fallen on sleep. What a magnificent torch it was!

How it shed light into darkened lives the world over! Constantly replenished at the Fountains of Eternal Truth, how unerringly it illumined the pathway of progress and achievement for those laboring to conserve the precious gift of sight throughout all nations. It was not the flickering though undying flame of an unknown soldier, but the beacon light of ophthalmic science set upon a high place by a chieftain known and beloved everywhere along the forefront of the battle for the prevention of blindness.

Hofrat Professor Dr. Ernst Fuchs was born in Vienna, June 14, 1851. He answered Fate's final roll call in the same city on Friday, November 21, 1930. During these fourscore years his personal influence was extended to every part of the globe reached by medical science.

While pursuing his medical studies he worked as an assistant in physiology at Innsbruck. After graduating in medicine he spent two years as surgical assistant under Billroth, thus laying a broad foundation for ophthalmic surgery and the training under Arlt which immediately followed.

He developed early that exceptionally well co-ordinated unison of clinical experience and pure scientific research which became an outstanding characteristic of his career as ophthalmic surgeon, author, and teacher. By personal investigation he became inti-

mately familiar with the problems presented by every variety of ocular disease.

At thirty years of age he was chosen to become professor of ophthalmology at Liége, in Belgium. It was at this period that he wrote the comprehensive monograph on the "Causes and Prevention of Blindness" which was awarded the first prize offered by the Society for the Prevention of Blindness of London in 1884. The jury making the award, composed of the ablest ophthalmologists of that day, frankly gave its unstinted praise to this essayist writing under the nom de plume "Viribus Unitis." A perusal of this rare and valuable book will convince anyone that the jury's selection is the chart whereby may be guided and directed all future efforts for the prevention of blindness.

Nearly fifty years later (1929) in Amsterdam, Holland, at a delightful gathering of international friends and admirers arranged by the Chicago Ophthalmological Society, the Dana Medal for Prevention of Blindness was presented to Professer Fuchs with the Latin inscription, the translation of which follows: "To Ernst Fuchs, teacher and physician and preserver of the gift of sight to the world, this medal, founded in America by Leslie Dana, is given." Around the rim of the decoration in letters of bold relief are the words: "Let the greatest gift of sight be preserved." In his response to the felicitations of representatives of England, France, Belgium, and other nations, he referred to the years spent at Liége as among the happiest of his life. Having just been married, he had entered his new professorship with zest and good cheer. His first son was born in Liége.

The international recognition he received while at Liége was only a foretaste of the universal homage that was to be his throughout life. He received the highest honors from the ophthalmic and scientific societies of both hemispheres.

After four years at Liége Professor Fuchs was recalled to Vienna to become the successor of Eduard v. Jaeger. The remarkable clinical knowledge which he exhibited as teacher and author was based on most thorough and extensive anatomical and pathological research. This he achieved under limitations of laboratory space and in spite of the incessant demands on his time by professional duties in a manner to excite the wonder and admiration of his

European colleagues, who knew best the restraints thus imposed upon him. His name attaches to many original observations, to the delineation of a variety of clinical entities, and to special surgical procedures. His mind ceaselessly recorded observations to be co-ordinated with facts discovered in the laboratory or hospital. Thus outings with his assistants on the snow covered hills round about Vienna furnished a basis for a study of erythropsia.

For well-nigh half a century ophthalmic literature has proudly recorded the contributions of his many sided genius. Even a mere review of the titles lies beyond our scope, but the greatest achievement of this distinguished teacher and author is his textbook on "Diseases of the Eye." It appeared in numerous editions and was translated into several languages, and soon became the standard throughout the world for instruction and reference about ocular diseases. His biographer in the Graefe-Saemisch Handbuch aptly remarks that each chapter was written as if it were the author's favorite topic, that it is never tiresome, but instructs as it entertains. Fundamental facts receive immediate recognition and emphasis, while "exemplary restraint" is shown about personal views on controversial problems. The author's readiness to receive with an open mind whatever may be new and to incorporate such ideas duly tempered by his personal experience and understanding into his textbook justifies that other striking comment concerning it, that the last edition is just as "modern" today as was the first edition when it appeared in 1889.

The thousands of students who were permitted to attend his surgical clinics bear testimony to the fact that, in addition to all other attainments, he was the master of ophthalmic surgery. His rich clinical knowledge and sound judgments were linked to an exceptional degree with a faultless surgical technique. American students owe a special tribute to Professor Fuchs, for he was the first in Vienna, while an assistant to Professor Arlt, to use the English language in giving them ophthalmic instruction. No greater impetus was given to American ophthalmology by any one person than by Professor Fuchs in his visit to this country in 1922, when he delivered his famous illustrated lectures on the histopathology of the eye to large groups of practising ophthalmologists and students in every section of this country.

His outstanding personal characteristics were clarity, goodwill, and serenity, joined with the innate modesty of true greatness. This happy combination of unusual gifts of mind and heart and soul was ever devoted to the welfare of the patient, whose unbounded confidence he merited and received.

In 1915 he voluntarily retired from his active professorship in order to devote all available time to ophthalmic research. His personal popularity encompassed every corner of distant lands, nearly all of which he visited, for he was an excellent and persistent traveler by land and sea and air. All the handiwork of man as well as the beauties of nature in earth and sea and sky appealed to him. From expressions of delight over the accuracy and legibility of the shorthand notes of a colleague, he would turn to an animated investigation of the vestiges of prehistoric moundbuilders. At seventy-eight he would set forth alone and unconcerned to visit the ruins of ancient temples and cities in Mexico and Central America.

To some it is given to be distinguished by great success in days of general prosperity. To others comes the distinction of outstanding leadership in times of much distress and sorrow. Professor Fuchs' professional and personal greatness of character shown forth under both extremes. He demonstrated how a man can be truly loyal to his Fatherland and yet not fail in his love toward all men regardless of political divisions and strife.

He trusted his fellowman, and in his simple, direct and friendly approach he conveyed this confidence so convincingly that it evoked an unfailing return of confidence, respect, and love from each one with whom he came in contact. How wonderfully simple and ideal international relations would become if every man met his brother in the spirit of this great ophthalmologist of all ages, who at the threshold of his beneficent career chose as his nom de plume, "Viribus Unitis"—"Through United Strength"—the union of all mankind for the prevention of blindness, for the welfare of the entire human family. It seems no more appropriate motto could be transmitted to the International Association for the Prevention of Blindness, which happily was organized last year with his cordial approval and active support. May the mantle of the master descend upon all those who shall go forth on this mission in every nation. Verily his works shall follow him.

Prevention of Blindness in the United States*

WITHOUT an occasional "bird's-eye view" one is apt to lose sight of the woods because there are so many trees. This concise summary of the movement for conservation of vision affords a panoramic picture of the interwoven medical, industrial, educational and administrative problems involved.

IN the effort to reduce blindness much work of necessity must be concentrated on the causes which produce the largest amount of blindness and which show some likelihood of yielding to concerted action. Among the major causes of blindness are: ophthalmia neonatorum (babies' sore eyes), venereal disease (gonorrhea and syphilis), trachoma, glaucoma, cataract, and accidents (general and industrial). In addition to these there are many other causes of relatively minor importance, if measured by the aggregate number of cases involved. Much of the blindness due to them can be prevented through prompt and continued treatment by an oculist. It is generally agreed also that much of the blindness from the major causes is preventable; the estimates run from 50 to 75 per cent. Ophthalmia neonatorum, for instance, was formerly responsible for more than 30 per cent of the blindness among children entering schools for the blind in the United States; in 1930 it was responsible for but 9.5 per cent. Trachoma is another cause of blindness which might be entirely eliminated; and the organized efforts to combat venereal disease, if successful, would still further reduce the number of those who are unnecessarily deprived of sight.

History and Present Status

The record of organized activities in this field covers a period of many years and represents the work of many different types of

* Reprinted by permission from the *Social Work Year Book*, Russell Sage Foundation, 1929.

agencies, public and private. Among the governmental bodies are the federal, state, or municipal departments whose major interest is health, or labor conditions, or education; and also the commissions or councils created by some states especially for work with the blind.

The United States Public Health Service, in co-operation with the states, is active in establishing relief measures for trachoma, and maintains a quarantine service to exclude immigrants afflicted with this disease. It has also engaged in epidemiologic studies and laboratory research to determine the cause of trachoma, has gathered data regarding legal provisions for lessening ophthalmia neonatorum, and has published reports concerning venereal disease as a cause of blindness. It has likewise conducted several studies to determine the conditions of eyesight among school children. State boards of health, in connection with their activities for the control of communicable diseases, are helping to reduce trachoma and venereal disease. Most states have now enacted legislation which makes mandatory the disinfection of all babies' eyes at birth, thus lessening the likelihood of ophthalmia neonatorum. In addition the elimination of such diseases as diphtheria, measles, smallpox, and so forth, prevents some blindness.

Municipal boards of health co-operate with public school systems in providing medical inspection, which usually includes the examination of the eyes of school children. This has led to much preventive work. Public schools are concerning themselves with proper illumination, legibility of textbooks, and the removing of defective vision through doctors' care and provision of glasses at cost or free. Inasmuch as defective vision is often the result of other physical conditions, any general school health activities have as a by-product valuable results in the conservation of eyesight. Public schools also maintain sight-saving classes for pupils whose defective vision makes it difficult or impossible for them to carry on the usual work of the school. The first sight-saving class was established in 1913. At the present time there are 371 classes in 22 states and 104 cities. It is estimated that approximately one child in every five hundred should have the benefits of a sight-saving class. Both health and educational authorities participate in the establishment and maintenance of such classes. State boards

of education and the federal Office of Education are interested in and help to promote these developments in the schools.

Another group of public agencies deeply interested in the prevention of blindness are those which deal with industry. The federal Department of Labor, in collecting statistics on various kinds of accidents, includes figures on blindness or impaired vision resulting from accident. It also studies industrial diseases which may result in blindness or impaired vision, and preventive measures to avoid them. State labor departments which administer state compensation acts are charged with the provision of medical and surgical measures to restore sight. Usually, also, they are responsible for factory inspection, and often for formulating regulations to safeguard conditions of employment. To reduce accident hazard they require installation of protective devices, use of goggles, and so forth, with a consequent reduction of catastrophes to the eyes.

State commissions or councils for the blind are usually charged with some responsibility for the prevention of blindness, but the activities actually carried on vary greatly in different states. The commissions in Massachusetts, Missouri, New Jersey, New York, Ohio, and Virginia, the Pennsylvania State Council, and the Connecticut State Board of Education for the Blind are among the most active in the field of prevention.

Private agencies which carry on work for the prevention of blindness are of two kinds: those organized for this single purpose and those for which activities in this field are merely incidental to their general purpose. The National Society for the Prevention of Blindness, organized in 1915, is the only national agency of the first type. It conducts surveys, advocates preventive legislation, carries on educational publicity, and co-operates with other agencies which have a responsibility for conserving sight. It is the best source of information about the sociological, economic, and health aspects of blindness and its prevention. It has no state branches and has never actively promoted the organization of local chapters. There are at the present time, however, two active local societies—the Illinois Society for the Prevention of Blindness and the Maryland Society for the Prevention of Blindness—each of which has its own budget and is undertaking local educational propaganda as well as case work for the prevention of blindness.

The National Safety Council is active in this field as in the prevention of other handicaps. Through traveling exhibits, lectures, and publications it endeavors to demonstrate appliances and programs designed to lessen the danger of accidental loss of eyesight, and also tries to win the co-operation of industrial concerns and their employees in observing reasonable precautions. The Council likewise works through them in educating their families to the necessity of protecting the eyes from undue strain or accidental injury. Among other national agencies with which the National Society for the Prevention of Blindness regularly co-operates are the following: American Child Health Association, American Foundation for the Blind, American Medical Association, American Public Health Association, American National Red Cross, American Social Hygiene Association, National Education Association, Conference of State and Provincial Health Authorities of North America, and National Organization for Public Health Nursing.

Training Requirements and Opportunities

Training in social case work is very desirable for any case worker in the field of prevention of blindness. A great part of such case work is carried on by social workers whose major activities are in family welfare or other fields. Social case workers in eye hospitals or clinics, or in state commissions and local associations for the blind, are among the relatively few who are employed entirely in the field of prevention of blindness. For such work the prerequisite is usually an approved course in public health nursing or in social work. Only rarely can persons qualified in both fields be secured. It is necessary therefore for the trained nurse to obtain some knowledge of social case work, or for the social worker to gain some knowledge of medical case work in the field of preventing blindness.

Training for teachers of sight-saving classes is almost indispensable because of the special equipment and technique involved in teaching children with seriously defective vision. The National Society for the Prevention of Blindness has aided various educational centers in offering such training. During 1929 it co-operated with four universities. In addition, courses were conducted at the Case School of Applied Science in Cleveland, Detroit City

College, and New York University. Full-time courses usually cover a summer session of six weeks.

Developments and Events, 1929

At the close of the International Congress of Ophthalmology, held during the year in Holland, an International Association for the Prevention of Blindness was organized, with headquarters in Paris. The general aims of the International Association are similar to those of the National Society in this country.

In November the National Society for the Prevention of Blindness held a conference in St. Louis which discussed particularly co-operative relationships in the field, from the points of view of official and volunteer agencies primarily concerned with work for the blind and of official agencies responsible for the prevention of blindness. During the year also the Society compiled findings based on the inspection of the eyes of about 1,000 preschool children. It also put into effect an active co-operative relationship with the American Federation of Labor. Members of the Society's staff were called upon to address industrial groups throughout the country and to prepare articles for labor publications.

One of the outstanding benefactions of the year was a grant of $250,000 by the Commonwealth Fund to Washington University, in St. Louis, for the purpose of carrying on research in the field of trachoma. The Leslie Dana Medal was bestowed by the Missouri Association for the Blind on Hofrat Ernst Fuchs, of Vienna, this being the first time that this award was made outside of the United States. It is bestowed each year on a person chosen for distinguished service, lay or professional, in the field of conservation of vision and prevention of blindness.

L. H. C.

Conservation of Eyesight, with Especial Reference to Glaucoma*

George S. Derby, M.D.

THE underlying principle of "prevention rather than cure" in modern public health activities has naturally directed attention largely toward children and young people. Dr. Derby, however, points out the importance of glaucoma—hardening of the eyeball—which is confined chiefly to the latter half of life. If discovered in early stages, glaucoma can almost always be controlled, and even when it is fairly advanced much can be done to prolong eyesight.

THE field of prevention of blindness, in which we are all interested, is a very large one, and many of its acres as yet have hardly been scratched by the plow of progress. We can look with satisfaction on the activities of the National Society for the Prevention of Blindness, and take a great deal of pride in its accomplishments, but we must not forget that prevention of blindness is still in its infancy. There remains a great deal to be done. How can we make every dollar of our very gratifying income pay the largest dividend? There are two sides to every question, but I must confess that in my own humble opinion we should concentrate our efforts on the very large opportunities for prevention which lie at our doors, and not wander too far afield.

What is the most promising field for preventive work at the present? I believe beyond question, and I think that upon reflection you will all agree with me, that it is the eye hospital, for to the many eye hospitals of this country come each day many thousands of people with abnormal eyes. Of these many thousands, only a small percentage is handled with prevention in mind. This is a

* Presented at the Annual Meeting of the National Society for the Prevention of Blindness, November 18, 1930.

fact that can be and has been verified. Read the Philadelphia Hospital and Health Survey, published a short time ago. I think in the past our Society has rather hung back from going into the hospitals, led by the fear that it was bad policy to risk a possible antagonism on the part of the medical profession. I personally believe that the matter can be so handled that such antagonisms will not develop. Now to illustrate what I mean I am going to talk a little in detail about an experiment which I invited the National Society to make nearly three years ago, an invitation to which the powers that be cordially and whole-heartedly responded after we had succeeded in convincing them that it was a justifiable experiment.

Last night at the Academy of Medicine we had a discussion on social service at which I know some of you were present. I hope many of you, because I feel that the development of eye social service is one of the most, if not the most, important factor in the prevention of blindness today. Hospital social service was started by Richard Cabot at the Massachusetts General Hospital in 1905. It has just celebrated its twenty-fifth anniversary. Some far-seeing people interested in prevention placed a social worker at our great eye hospital, the Massachusetts Eye and Ear Infirmary, in 1909. This I believe was the first real eye social service in this country, probably in the world. This tender flower has grown to be a sturdy plant. We have now six eye workers. With the help of these eye workers our hospital has been enabled to do a very considerable work in the prevention of blindness. It took several years at least for our social service department to fix its roots so that it was ready to expand, and then, under the advice and with the co-operation of the medical staff, intensive work among special types of eye disease was undertaken, I think I may say very successfully, along the following chief lines: gonorrheal disease of the eyes in babies; tuberculosis of the eyes in children and adults; hereditary syphilitic disease of the eyes in children; and progressive myopia.

These were all diseases of children and young adults, but a very common disease, largely of the latter half of life, remained outside of our efforts. The need of tackling this great problem was evident, but we did not have the means. It meant a special social

worker, and it was this problem that has been financed in our hospital by this Society. The disease is glaucoma, hardening of the eyeball, and it causes one-quarter to one-third of all blindness in this country occurring after the age of forty-five. If discovered in its early stages, it can almost always be controlled, and much can be done to prolong eyesight even in those in whom the disease is fairly advanced. Think of the enormous amount of eyesight which is unnecessarily lost! I am going to show you a few pictures which I hope will explain to you what I am talking about.

Anatomy and Physiology of the Normal Eyeball

In the first place, it is necessary to learn a few facts about the anatomy and physiology of the normal eyeball. This can be accomplished best by means of diagrams: Figure 1 is a section of the human eyeball cut lengthwise. The letter "A" is the clear watchglass front (cornea) of the eyeball through which we look; "B" is the anterior chamber, a space filled with clear fluid, known as the aqueous; "C" is the iris, a movable diaphragm, the opening of which is indicated as "D", the pupil. Back of the iris and the pupil lies "E", the lens which focuses the rays of light. The interior of the eye, "F", is known as the vitreous chamber, and is filled with a clear, jelly-like fluid. The little frill-like processes, "G", which surround the lens, are to be noted; these are the ciliary processes. They are very important and will be referred to again later. In the back of the eye is "H", the great optic nerve whose fibers spread over the interior of the eye and form the retina.

If you will place your fingers on your eyeball, you will find that it is firmly elastic to the touch. In other words, to maintain its shape and fulfil its functions the fluids within the eye must be maintained at a certain degree of tension or pressure. Now this concerns us deeply, since glaucoma represents an increase of the pressure within the eye. Let us see the mechanism by which this pressure is maintained. Let us draw a line vertically through Figure 1 and take the front half and magnify it into Figure 2. We now see more clearly "G", the little frills which are known as the ciliary processes. From these processes is thrown constantly the watery fluid known as the aqueous, which maintains the pressure in

the eye and nourishes some of the structures, like the lens, which have no blood vessels. A small amount of this fluid passes back into "F", the vitreous, but most of it passes forward through the pupil into "B", the anterior chamber. Here it must find some way of escaping from the eyeball or it would accumulate there and the eyeball would become hard. To accomplish this purpose there is

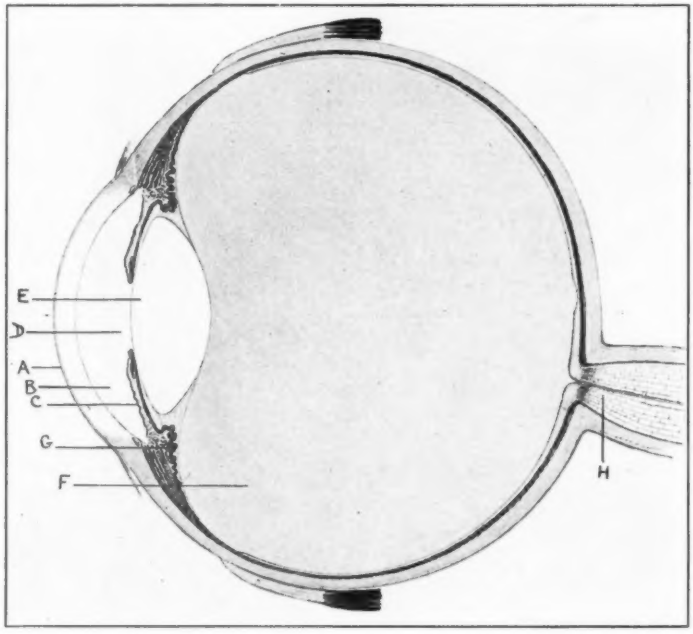

Fig. 1.—Cross-section of the human eye. A, cornea; B, anterior chamber; C, iris; D, pupil; E, lens; F, vitreous chamber; G, ciliary processes; H, optic nerve.

a very delicate little sieve situated at the angle of the anterior chamber and known as the pectinate ligament, indicated by the letter "I". Let us take an enlargement of this region and call it Figure 3. "A" is the margin of the cornea, "B" is the angle of the anterior chamber, "C" is the root of the iris, and "D" is the sieve known as the pectinate ligament. This little sieve or filter

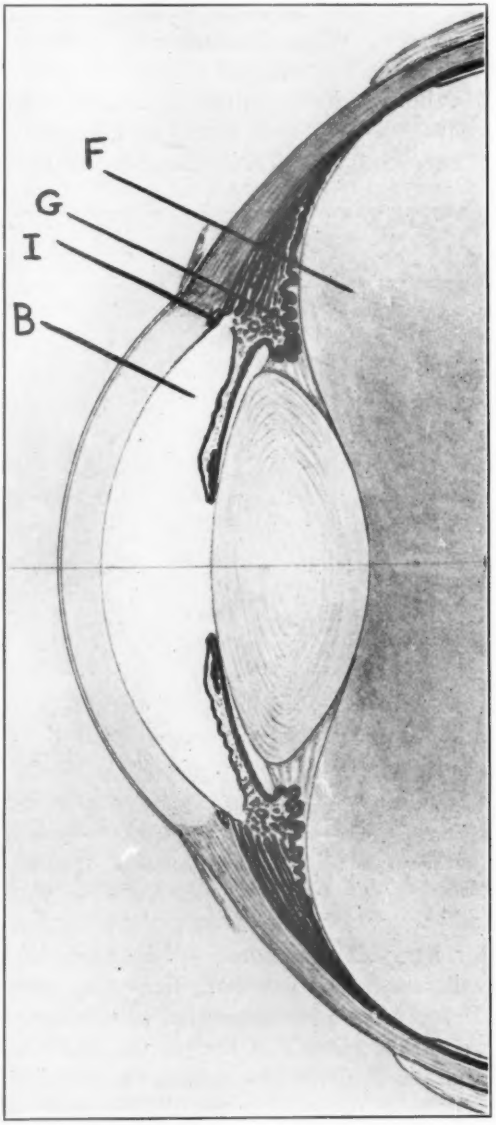

Fig. 2.—Enlarged front of an eye as seen in Fig. 1, showing the ciliary processes more clearly. F, vitreous; B, anterior chamber; G, ciliary processes; I, pectinate ligament.

allows the fluid to escape from the eye into the meshes of the sieve and from there into a system of veins which convey it outside the

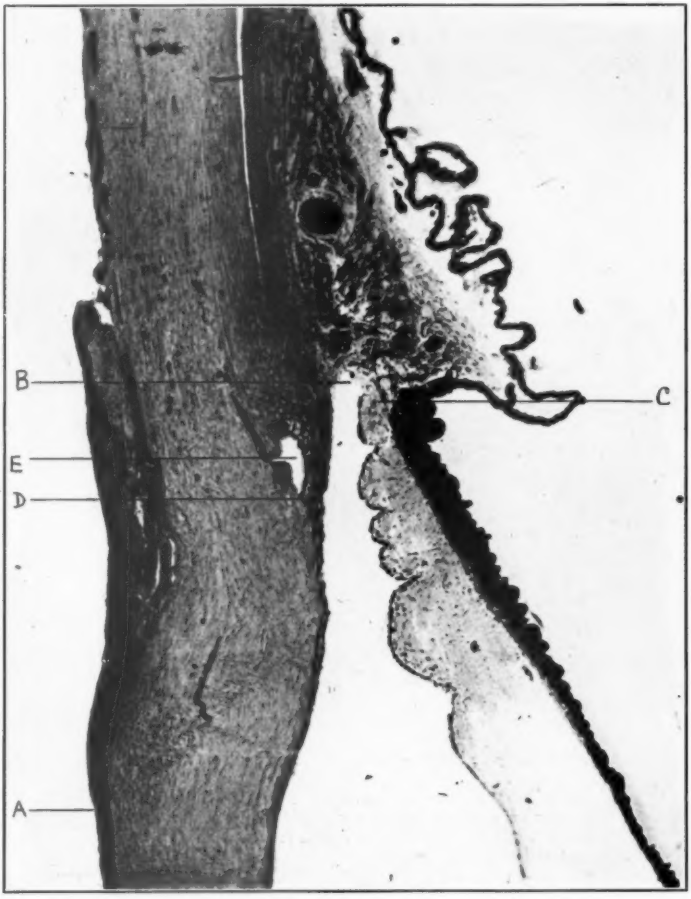

Fig. 3.—The angle of the anterior chamber, showing important points in the development of glaucoma. A, margin of cornea; B, angle of the anterior chamber; C, root of the iris; D, pectinate ligament; E, channel which conveys fluid outside the eye.

eyeball. "E" is a large channel whose function it is to convey the fluid outside the eye.

What Causes Glaucoma

Now let us suppose that these outlets from the eye become stopped up. Then the pressure within the eye will rise and a serious condition will develop because the delicate structures within the eye, the delicate nerve-fibers which spread out from the optic nerve and form the retina, become compressed. When this condition of increased pressure of the eyeball occurs, it is known as

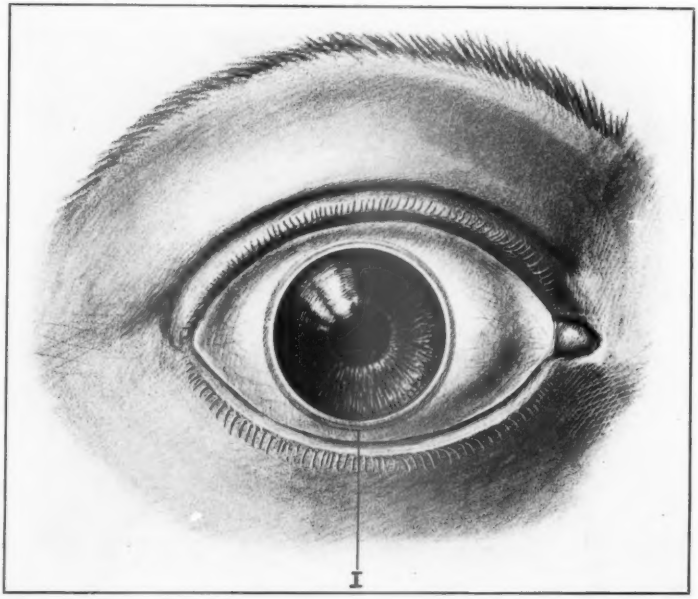

Fig. 4.—Front view of the human eye. Large black center is the pupil; surrounding dark area, iris, and outer circle, I, is a diagrammatic representation of the tiny channel through which fluid is removed from the eye. In Fig. 3 it is designated as E.

glaucoma. We do not know the causes of most forms of glaucoma, but we know what happens.

Figure 4 shows the front of the eye. The outer circle, "I", represents the sieve-like pectinate ligament through which the aqueous fluid drains. Now one of two things can happen: the whole circle can suddenly become stopped up by pressure from be-

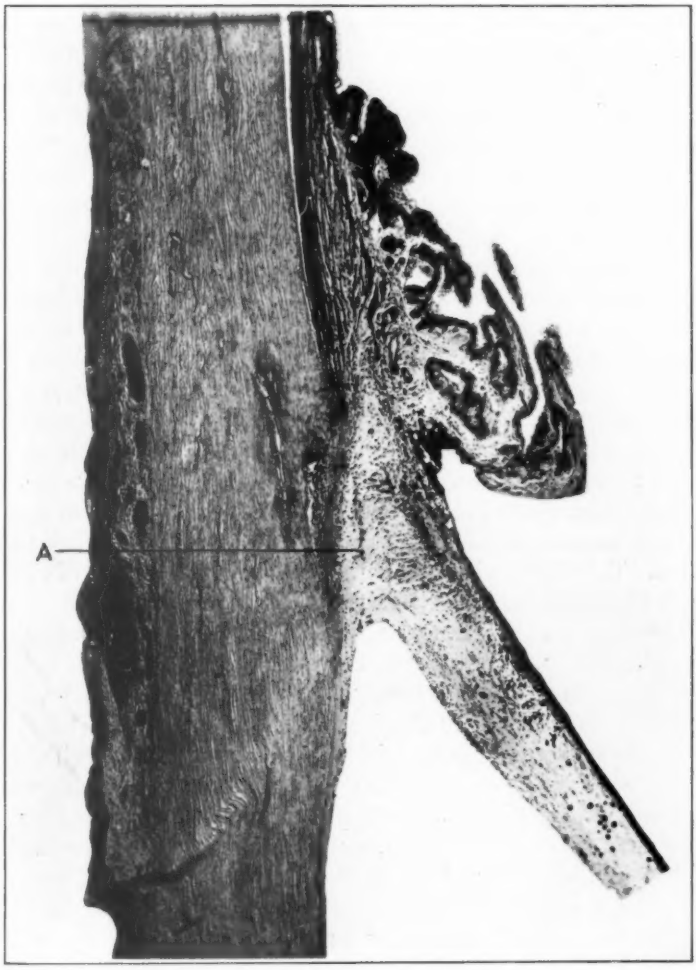

Fig. 5.—An enlarged reproduction of the angle of the anterior chamber, showing partial blocking of the pectinate ligament. A, point at which root of the iris is adherent to the back of the cornea.

hind; or it may slowly become stopped up. This rapid stopping will cause a sudden rise in the pressure within the eye; the eye becomes rather hard, it is red, the pain is intense, the front of the eye becomes gray and cloudy, the sight becomes dim, and finally, unless the pressure is relieved, sight is permanently lost. This is known as acute glaucoma. The pain is so acute and the loss of sight so alarming that the individual almost always seeks medical advice and sight can usually be restored by a skilful operation if performed within the first day or two. This form of glaucoma furnishes its own unmistakable danger signals.

The form of glaucoma which we wish to bring to your notice is one without early danger signals, a form which causes an infinitely greater amount of loss of sight and blindness than does the acute form. Let us suppose that the drainage apparatus which we have described becomes obstructed gradually and that the pressure within the eye becomes higher by degrees. The delicate fibers of the optic nerve gradually lose their function and die. (Compare Figure 5 with Figure 3.) Here the pectinate ligament has become partially blocked, some fluid can still get through, the root of the iris has been pushed forward and has now adhered to the back of the cornea. This change is practically always found in cases of chronic simple glaucoma, which is the type of disease which is so important for us to understand. Let us now go to the back of the eye and see what changes increased pressure produces there. Figure 6 represents the posterior half of the eye. We see the optic nerve, "A", spreading its fibers over the interior coat of the eye, "B", the retina, the seeing membrane of the eye. The pictures of all objects which we see are thrown on this membrane from the outside world. If these pictures are to be seen distinctly, they must fall on one small area, the macula lutea, or yellow spot, which is situated directly in the center of the back of the eye. The yellow spot, "C", forms a small depression in the retina. The entrance of the optic nerve has no retina over it; therefore it is blind and it is known as the blind spot. Every one has this blind spot. If you will close your left eye and hold Figure 7 about 10 inches away and look at the circle the cross will not be seen—its image falls on the blind spot. If you will hold the tip of your finger a few inches away directly in front of your right eye with your left one closed

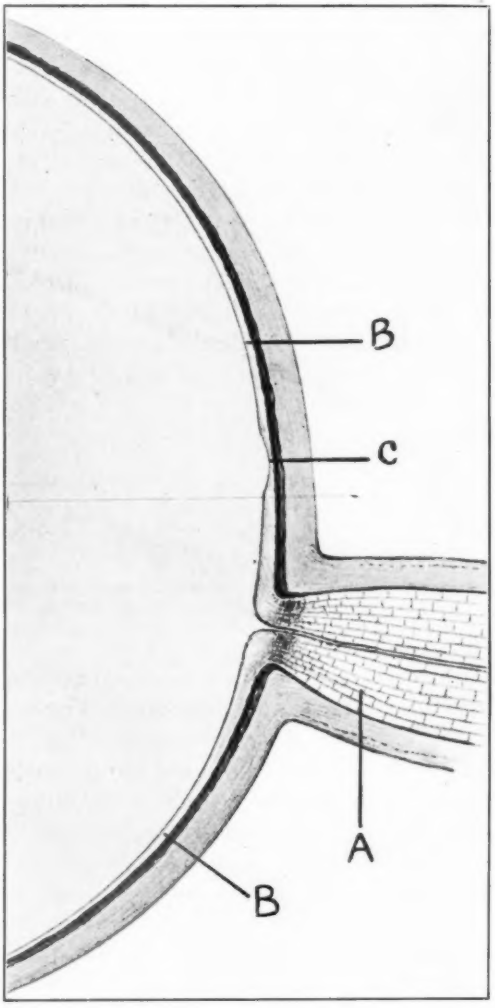

Fig. 6.—Cross-section of the posterior part of the eye, showing, A, optic nerve; B, retina; C, area of the macula or place of acute central vision.

and look directly at your finger tip, you will find that your clear vision for objects beyond is lost and that the objects that you see around your finger tip are seen indistinctly; only objects seen with central vision are seen distinctly—everything else is blurred. In the development of the human species central vision is a late acquisition. The lower animals do not have it. The rabbit cannot see anything very distinctly, but he makes up for it by being able to see almost around the whole circle, as his eyes are placed in the side of his head. Thus his very wide field of vision is a great protection against danger. In the human species the eyes are placed in the front of the head and the field of vision of each eye is limited by the conformation of the face. To the outer side one can see at right angles (90°); at the nasal side the limit is about 60°; below, 70° to 80°; above, 45° to 55°. These facts about central vision and

Fig. 7.—Chart used to locate the blind spot. By closing left eye and looking at the circle at a distance of from 8 to 10 inches, the cross is invisible, since its image strikes the blind spot of the eye, i. e., where the optic nerve enters the eye.

the field of vision must be known if we are to appreciate the changes which take place in chronic simple glaucoma. Figure 8 represents the normal field of vision of the right eye as you face it. "A" is the central area of acute vision; "B" is the blind spot; "C" is the nasal side constricted by the nose; "D" is the outer or temporal side. (Compare Figure 9 with Figure 6.) In Figure 6 we see the normal optic nerve entrance; in Figure 9 we see the nerve entrance in glaucoma. How the nerve fibers have been pressed in is evident. This concavity, "A", is known as a glaucomatous cup. Looking into the eye with an instrument known as an ophthalmoscope one sees Figure 10, the normal optic nerve head. Figure 11 represents a nerve head showing a glaucomatous cup. This cup is caused by the increased pressure in the eye. This increase in pressure can be accurately measured by an instrument known as a tonometer. A drop of holocain to render the eye insensitive is applied, the base of

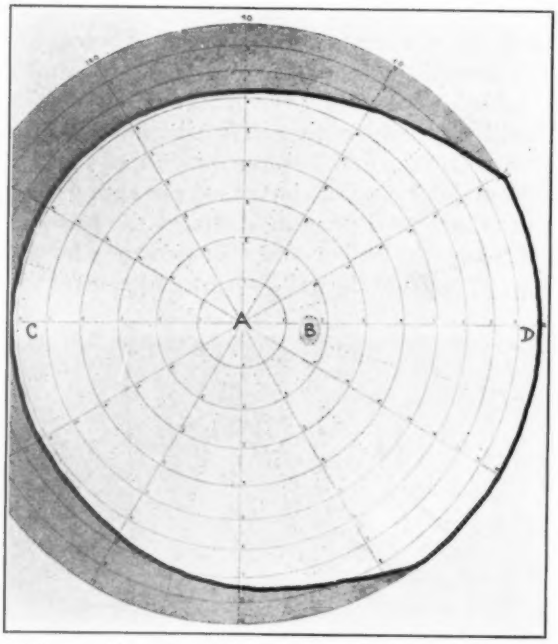

Fig. 8.—Diagrammatic charting of the field of vision of a normal eye. A, center area of acute vision; B, blind spot; C, nasal side; D, temporal side.

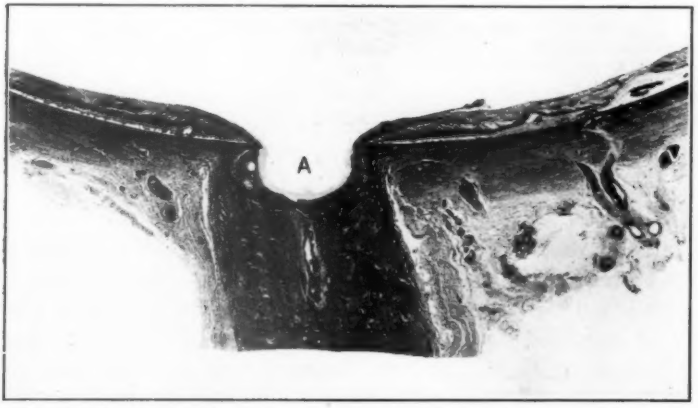

Fig. 9.—Cupping of the optic nerve due to the high inside pressure in a glaucomatous eye. A is known as a glaucomatous cup. Compare with Fig. 6.

the tonometer is placed on the front of the eye, and a reading is taken. Figure 12 represents the tonometer of Schiötz. Figure 13 indicates the base of the tonometer indenting the front of the eye. Thus we now have two signs by which chronic simple glaucoma can be recognized by the expert physician who has specialized in diseases of the eye. He can look into the eye and see the glaucomatous cup, and he can determine the increased pressure with the tonometer. Now the increased pressure damages the fibers of the optic nerve which form the retina and this damage shows itself in a peculiar way. It affects the yellow spot and central vision late in

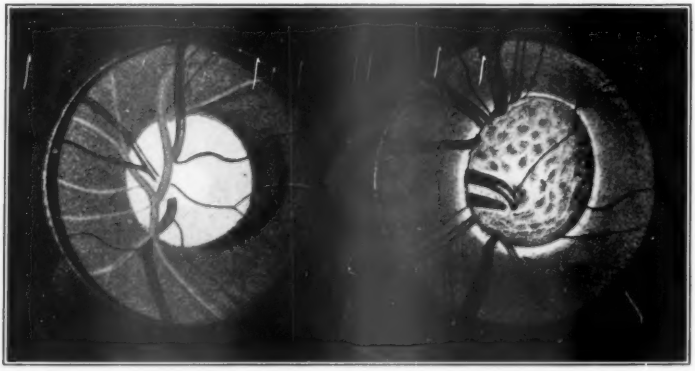

Fig. 10 Fig. 11

Figs. 10 and 11 illustrate respectively what a doctor sees in a normal eye and a glaucomatous eye through an ophthalmoscope: 10 is a normal optic nerve head; 11 is a glaucomatous one.

the disease. Thus, up to a late stage in chronic simple glaucoma we can see directly in front of us just as well as we ever could. This is one reason why so much loss of sight is caused by this disease, because as long as a person can see distinctly in front of him he does not become alarmed. When central sight becomes indistinct the disease is in a late stage and much more difficult to contend with. The field of vision, however, becomes affected relatively early in this disease and if we know the characteristic changes which occur and can find them by making a chart of the field of vision, we are in an immediate position to help the patient. There

Fig. 12.—Tonometer used to measure the pressure in the eye.

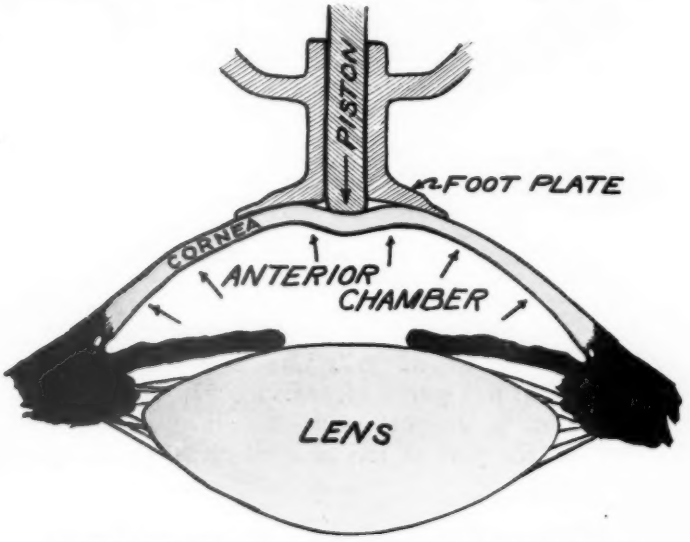

Fig. 13.—Indicates the base of the tonometer indenting the front of the eye.

are two characteristic early changes in the visual field. One is a characteristic notching, like a piece of pie, on the nasal side, known as the nasal step. The second is an enlargement of the blind spot known as Bjerrum's sign.

Compare Figure 14 with Figure 8, showing the normal field of

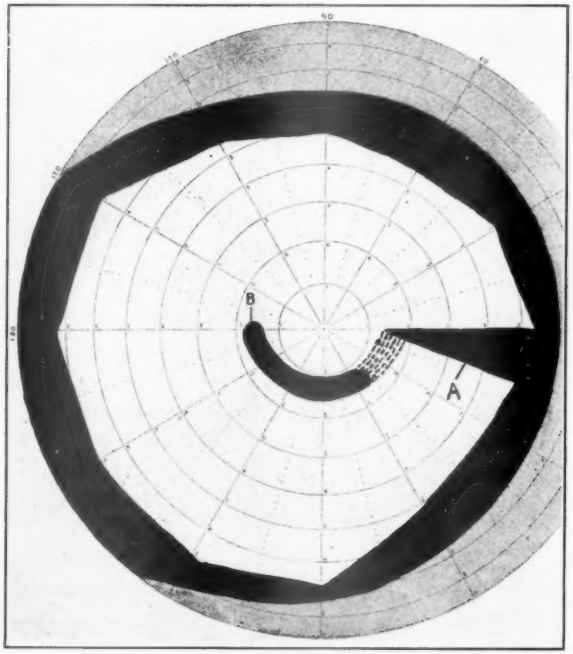

Fig. 14.—Diagrammatic charting of the field of vision, showing slight progress of glaucoma. The white area still sees; the encroaching black areas are blind. Compare with Fig. 8.

vision of the left eye. In Figure 14 we see the nasal step, "A", and the enlarged blind spot, "B". Compare Figure 8, the normal field of vision, with Figures 14, 15, 16, 17, and 18, showing various types of progressing glaucomatous fields. The white areas represent the part of the field which still sees; the black areas are blind.

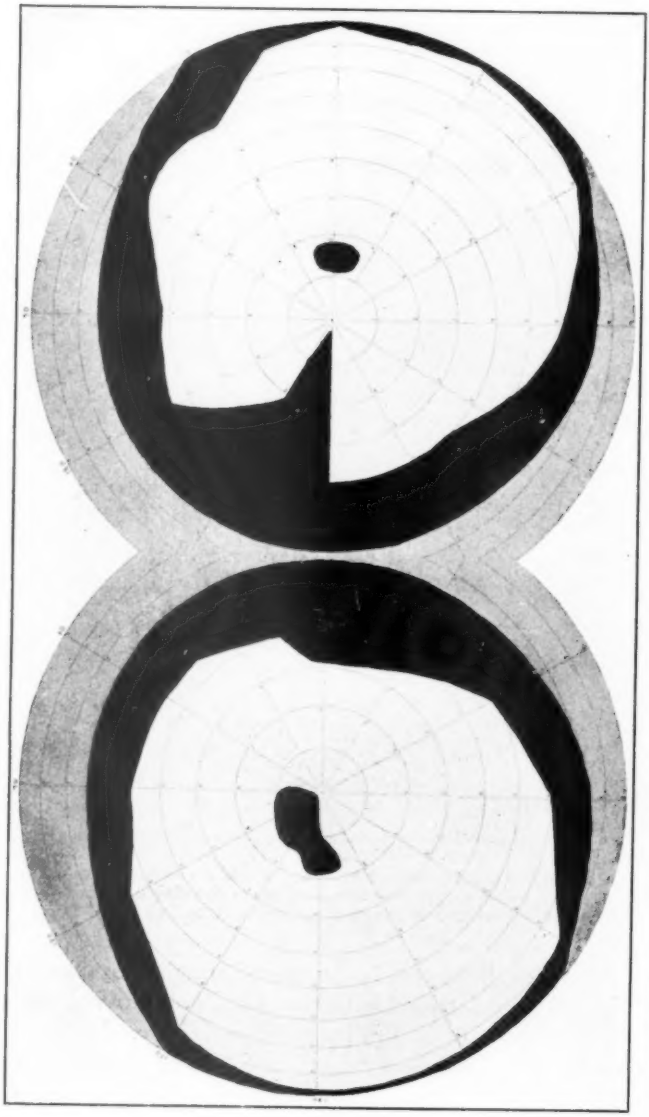

Fig. 15.—Diagrammatic charting of the field of vision, indicating extension of the blind area in the glaucomatous eye.

Signs of Chronic Simple Glaucoma

We now have the three cardinal signs of chronic simple glaucoma which can be recognized by the expert: the increase of pressure, as measured by the tonometer; the cupping of the nerve head, as seen with the ophthalmoscope; the contraction of the field of vision, best measured by an instrument known as the perimeter. The

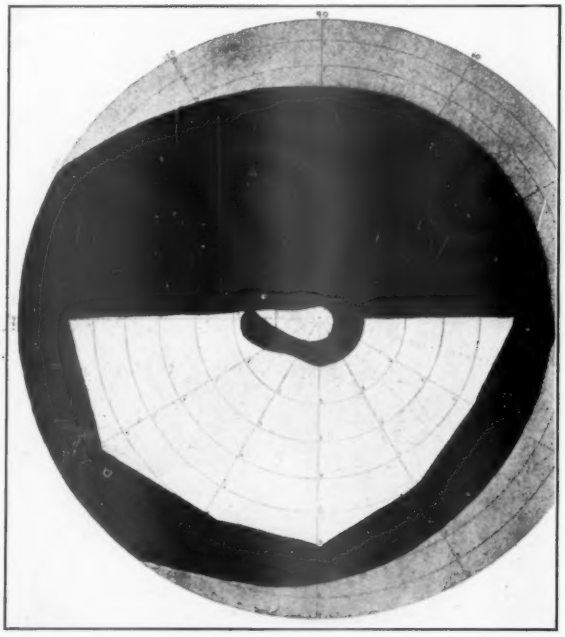

Fig. 16.—Diagrammatic charting of the field of vision of a glaucomatous eye in a still more advanced stage, showing darkened area of blindness encroaching further in the field of vision.

field of vision can, however, be measured roughly by closing one eye, looking straight forward with the other, and moving the hand (especially on the nasal side) in from the periphery. In this way a rough idea of the visual field contraction can be determined. In advanced glaucoma the hand may be brought in to the center or farther before it is seen.

In Figure 17 only a small area of the visual field remains. The patient's sight is constricted and the world appears to him as though he were looking through a rifle barrel. And yet he can read print, one or two letters at a time, if they are placed directly in the right position.

There are minor signs of glaucoma also which the patient may

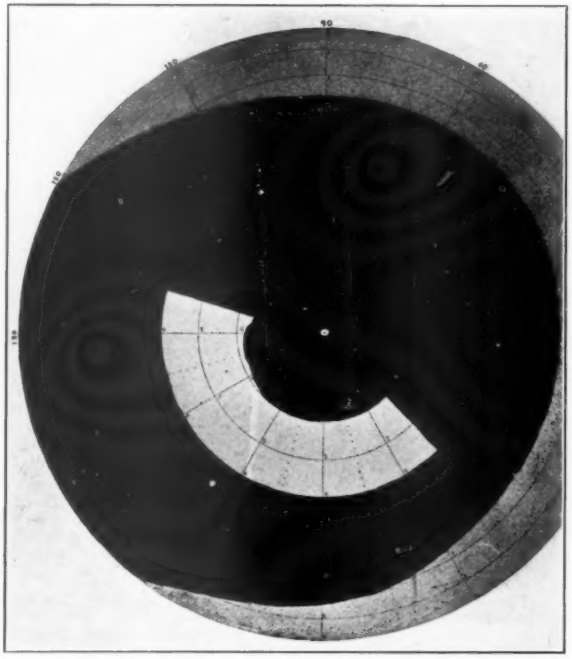

Fig. 17.—Diagrammatic charting of the field of vision of a glaucomatous eye, showing only a small area of the visual field remaining.

notice: temporary haziness of vision, the seeing of rainbow rings around lights at night, difficulty in reading, the necessity of a very rapid increase in the strength of one's glasses. But glaucoma can exist without one's noticing such signs, and it is therefore advisable after middle life to have a periodic examination of the eyes made by an expert.

Treatment of Glaucoma

Glaucoma if untreated leads to blindness. Glaucoma recognized late is exceedingly difficult to control. Glaucoma recognized early lends itself much more favorably to treatment. What is the treatment of glaucoma? It must be some method which will bring back

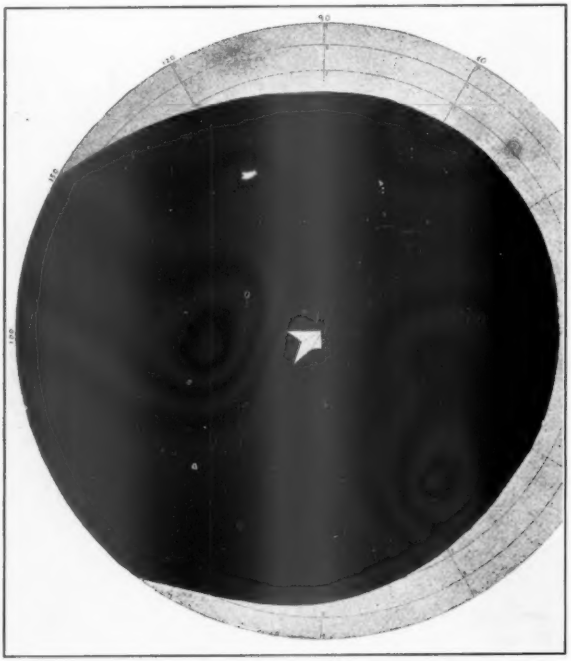

Fig. 18.—Advanced glaucoma. Only center area of vision left.

to normal the increased pressure in the eye. This naturally cannot be accomplished by glasses. There are certain drugs known which contract the pupil and lower the pressure in the eye. In certain cases, carefully selected by the expert, these drugs may be used to control the disease and drops are therefore put in the eyes regularly four or five times a day. In spite of using these drops the disease is likely to progress slowly and after a time the drops lose their effect. Therefore, in most cases the proper treatment of

glaucoma is an operation skilfully performed. We have shown in Figure 5 how the drainage area of the eye becomes partially blocked. Once blocked in this way, it can never be restored. But it is usually possible to make a new drainage pipe which will keep the pressure of the eye permanently low. Such operations are now being performed throughout the world by the hundreds, and show a very large percentage of success. Let us remember one other thing: Chronic simple glaucoma almost always sooner or later affects both eyes.

If we can get these people early, and usually we operate, then sight can be saved, certainly prolonged. More should be known by the public in regard to glaucoma. The medical profession should be informed of the waste of sight. The budding oculists should be specially instructed in this disease and in the very delicate tests which are necessary often to detect it, and always to measure its progress.

Medical Social Service in Glaucoma

The National Society gave us a worker. We reorganized our clinic so that we could give special attention to these cases; they require a time-consuming examination, and it is necessary to see them frequently. Every glaucoma patient must visit our clinic at least twice a year. They are a difficult class of case to handle, because you cannot restore their eyesight. The best you can do is to preserve what they have. They feel that they are not improving, they go to other hospitals, to quacks, etc. We had handled a somewhat similar problem with our hereditary syphilis cases some years before. We found that the social worker and a proper medical organization were the answer then, as they are now.

Glaucoma in the Massachusetts Eye and Ear Infirmary

Let me give you a few simple figures to show what the result has been up to the present time.

In 1926, 209 glaucoma cases were being worked on intensively by our social service department. We had some 300 additional names on a follow-up list, but we were able to pay but little attention to them. A postal card sent, now and then, asking them to report accomplished little.

In 1927 there were 262 glaucoma cases listed for intensive work. In 1928 Miss Janet Gorton, the worker furnished by funds from the National Society and trained by us, took hold, and the real increase began. That year we handled 582 cases and the patients were all seen, interviewed, worked with, and the majority visited in their homes.

In 1929 we had 740 cases, and in 1930 we shall show as many or even more cases. For each of the last two years we have had 316 new patients, and 20 reinstated. The average is 9.8 glaucoma cases per day in the clinic. Of a total of 279 cases of primary glaucoma only 18 refused to co-operate at all, and we lost sight of only 7. In 1928, 55 cases of primary glaucoma were admitted for operation. In 1929, 116 cases were admitted for that purpose. Under the old system it was quite a usual experience to have a patient on whom an operation was deemed necessary refuse in spite of all the arguments we could bring to bear. At present, when the patient refuses, we call the social worker and say, "This patient should come in to be operated on." A week or so later the social worker remarks that Mr. So-and-So will be in next Monday for his operation. Miss Amy Smith, head social worker of the Massachusetts Eye and Ear Infirmary, reports that in 1929, 126 patients were aided by some relief or welfare agency. This figure shows that there is not a large proportion of very poor patients; that the majority of patients are on a little better economic basis; that a great deal of the work is educational—interpreting the medical situation to the patient; and that the work is very constructive.

While this glaucoma experiment has excited our intense interest, it has been a severe tax on our medical staff, which is one of the reasons why we are now adding an extra interne to the hospital.

Even the few figures I have presented speak eloquently. The 740 glaucoma patients we had last year were candidates for blindness, and certainly we have done a great deal toward preserving their sight during life, or at least in prolonging their vision.

Eye social service is very undeveloped throughout the eye hospitals of the country, often non-existent. Glaucoma is only one of the serious eye diseases which lends itself to attack by these methods. Our social service department has offered without charge to train for eye hospitals any workers who may be sent to us. In

my opinion a very great opportunity is now knocking at the door of the National Society for the Prevention of Blindness, and I would strongly urge that in the future a substantial sum be set aside in the budget each year to train a certain number of workers in eye social service, and to place them in hospitals at strategic points throughout the country. If carefully chosen and financed by the Society for a few years, I feel confident that they will prove their value and will be taken over by the hospital authorities. This is, in my opinion, one of the most potent methods of conserving eyesight. It is to be sincerely hoped that this Society will feel constrained to direct more of its activities into this field.

Fundamentals of Lighting in the Home, Classroom and Industry*

A. L. Powell

MANY persons overlook the importance of proper illumination for the conservation of vision. As diseases and accidental injuries may cause blindness, so poor lighting may eventually lead to impairment of vision.

AS a youngster I was always quite fascinated by the vaudeville acts of jugglers and the magicians. I learned a story then which I shall always remember. We are still all children and we like to have the speaker play with something, have, as it were, a bag of tricks so that we can see the wheels go around. So I very rarely take up the subject of lighting without a few pieces of simple experimental apparatus.†

I should like to refresh your memories on some things which are not necessarily new, but which are vital. Through constant education on the part of many organizations there has grown up a greater and greater appreciation of what light will do in promoting efficiency. Unfortunately, however, this knowledge has been chiefly put into practice only in business organizations—industrial plants, offices, mercantile establishments—which are lighting to far higher levels than ever before. This is good business.

In our schools a most deplorable state of affairs still exists, particularly in the older buildings, and even in some of the new ones. We are nowhere near to that quality and level of illumination that we find in the ordinary good office. This is almost criminal, because children's eyes, as you know far better than I,

* Presented at the Luncheon Conference on the Relation of Lighting to Vision Conservation, Annual Conference of the National Society for the Prevention of Blindness, November 17, 1930.

† Editor's note: Very interesting exhibits and slides were used to illustrate this talk.

are in a formative state and need better lighting than the eyes of adults.

In addition, the children's homes, where they must do most of their studying and reading, are poorly lighted. Sometimes I almost give up my job when I go from home to home and see the kind of illumination people endure. Apparently they never realize the need of good lighting. They will change their draperies and their furniture, but go on with antiquated types of fixtures, designed for low power candles, gas lamps, etc. If there ever was a curse and an abomination to good lighting, it is the ordinary type of side bracket placed on the wall, directly in the line of vision. In it we find fifteen, twenty-five and sometimes as high as sixty or even seventy-five watt lamps, used unshielded. The idea of placing a big lamp bulb on the end of a paper tube, putting on some imitation grease to make it look like a candle and having a little cup to catch the grease is about as far from logic as it can be. Yet this type of fixture is still being sold. Thank goodness, in so-called modern art it is going to be eliminated gradually.

Incidentally, do not be too critical of what is called modern art. Modern lighting is not necessarily fantastic. A modern lighting fixture, as I define it, is one that gives the modern light source—the Mazda lamp—a square deal. On that basis, there are many excellent types from which to make a choice.

It is often very difficult to talk to the housewife about what is wrong with her lighting. She uses it every day, is familiar with it, and therefore thinks she knows all about it. Then, too, random statements are often made by architects, decorators and others who have never given lighting serious thought. They do not know the fundamental principles of illumination. One of the most common examples of this lack of understanding of the principles of illumination is the mistaking of brightness or glare for excessive lighting. I remember about ten years ago a group of physicians investigated the lighting in some offices in lower New York. They reported that the majority were overlighted. When the illumination was measured, it was found to be far below the ordinary commonsense standards. Glare had been confused with amount.

Recently I heard a very prominent architect give a talk in the course of which he said, "In lighting a room you can have too little

light, but it is just as bad to have too much light." I have never yet seen a case of too much light. Again glare was confused with amount. The normal interior illumination may have five, ten or fifteen foot-candles, yet out of doors, as you know, our eyes function under 300, 500 and 1,000, and on a bright day, even up to 10,000 foot-candles.

The foot-candle is a simple thing. It is the measure of the amount of light on the work. The thermometer is available to measure the amount of heat present. You are comfortable when the temperature is seventy or seventy-two degrees, but you may not know what a degree of Fahrenheit is. Similarly, there is the means of measuring the amount of light on a working surface. This device is called a foot-candle meter. The amount of light is ascertained by placing the foot-candle meter at a normal working level and reading the results registered on the meter, in a manner similar to that in which you read the thermometer.

We must obviously have enough light on the work to see comfortably. Lighting engineers and societies have worked out the standard illumination for different classes of service. These standards are presented in the government bulletin, "The Code of Lighting School Buildings" (publication number 382, United States Bureau of Labor Statistics). This code contains a wealth of information; it is a veritable handbook for your guidance. It tells us that for classrooms the minimum of illumination should be five foot-candles; a level of ten foot-candles is, however, recommended.

What does this level of illumination mean to us in our ability to see? You are more familiar with the Snellen chart than I am. If you were to go into an ophthalmologist's office, or any other place where this chart is used, you would probably find fifty different levels of illumination used in as many offices. This subject was investigated as a basis for a paper on a study of illumination of standard eye test charts and it was found that medical men had, in general, no full appreciation of the fact that illumination makes a marked difference in visual acuity.

We have tested visual acuity under poor light and then in increased light on probably tens of thousands of people. There has never been a case in which the visual acuity ascertained by a

poorly lighted Snellen chart did not improve at least a line with a higher level of illumination. A man in an industrial plant may have his eyes tested on a chart which will be well illuminated with daylight. In another plant or another part of the same plant the chart will be badly lighted. Naturally his visual acuity appears to have changed. He may think his eyesight is failing, whereas the trouble is with the light on the chart.

It is interesting to know that in increased illumination objects appear to move more slowly, hence can be seen better. The application of this principle in illumination in industry needs no explanation.

Poor illumination is not confined to too little light, but glare is an even worse defect. I have seen workmen hang a bare, unfrosted lamp directly in their field of view. There is no doubt in my mind that they are not only producing a temporary effect on the vision, but, as a result of days of exposure, may actually injure their sight. Reflected glare is as bad as direct glare. This is a very important point as far as the school is concerned, because light coming from below strikes a part of the retina which is very sensitive and there is not the shielding effect of eyebrows. Many business men, working in an office with polished glass desk tops, do not realize that these continually reflect the light source overhead. They wonder why they have headaches.

Let us analyze roughly two or three points applying to school lighting. In addition to providing adequate lighting, the surroundings must be considered, since they have quite an effect on the illumination. In the second column of Table I is listed the effect of light ceilings and light walls. Thus a thousand watts may be necessary under correct conditions to illuminate a given room. If in that same room there are dark walls and ceiling, it will take, in the case of totally indirect lighting, practically three times the wattage for a given level of illumination; in the case of the ordinary enclosing globes, practically fifty per cent more. These figures are all available in "The Code of Lighting School Buildings."

There is another point; no matter how good the illumination provided, if the luminaires are not kept clean the results will be unsatisfactory. I have occasionally taken out fully a half handful of dead flies and dirt from globes. Housewives will clean the rest

TABLE I

EFFECT OF COLOR OF WALLS AND CEILING ON WATTAGE CONSUMPTION

If 1,000 watts are required to illuminate a given area to a certain intensity with light (practically white) walls and ceiling, a higher wattage will be needed with darker walls and ceiling.

	Ceilings Light Walls Light	Ceilings Medium, Walls Medium	Ceilings Dark Walls Dark
R.L.M. standard dome (white bowl lamp)	1,000	1,060	1,100
Glassteel diffuser	1,000	1,080	1,140
Prismatic glass	1,000	1,190	1,360
Totally indirect	1,000	1,550	2,840
Enclosing globe	1,000	1,240	1,550

of the house but leave the lighting fixtures absolutely untouched. With indirect lighting, if the fixtures remain uncleaned for twenty weeks (and some people allow them to go much longer), the illumination is cut down to about fifty per cent of its original value. Table II indicates percentages of depreciation in various types of luminaires.

TABLE II

APPROXIMATE DEPRECIATION EXPRESSED IN PERCENTAGE OF INITIAL ILLUMINATION ON THE WORKING PLANE (ESTIMATED FROM TEST RECORDS)

Type of Unit	4 Wks.	8 Wks.	12 Wks.	16 Wks.	20 Wks.
R.L.M. standard dome	4	8	10	12	14
Glassteel diffusers	6	9	11	13	15
Opalescent enclosing globes (no vent)	7	10	12	14	16
Translucent direct lighting bowl reflectors	10	14	17	20	22
Semi-indirect	14	23	32	36	40
Total indirect	18	33	41	48	50

Figure 1 presents a night view of a grammar school classroom specially lighted for the benefit of children with defective vision. Six 300 watt lamps are used in color modifying glass enclosing

Fig. 1.—Adequate lighting for a sight-saving class.

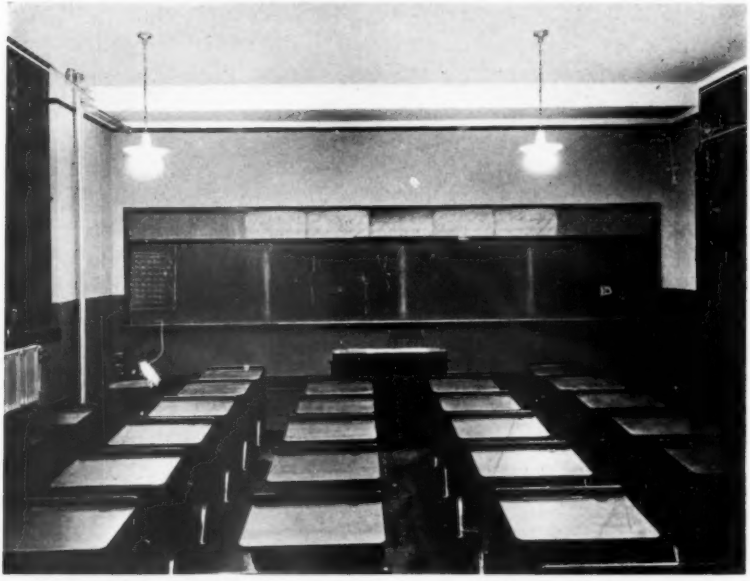

Fig. 2.—Adequate lighting by metal and glass semi-indirect units for classroom.

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globes mounted on the ceiling. The room is 24 ft. by 32 ft. with a 12 ft. ceiling. Six 25 watt Mazda lamps are used for the lighting of the side blackboards. The average illumination on the desks is 15 foot-candles, and blackboards are lighted to the same level. This illumination, somewhat higher than normally supplied, has proved very beneficial with these children who have sub-normal vision. The special blackboard lighting is another feature which has marked advantages. Figure 2 presents a night view of a class-

Fig. 3.—Manual training woodworking shop.

room lighted by metal and glass semi-indirect units. Diffusion is excellent, direct and reflected glare are at a minimum, and a neat appearance is presented by the installation. Four 300 watt, all frosted, Mazda lamps are used, providing a uniform illumination of 9 foot-candles on the desk top. Figure 3 presents a manual training woodworking shop with modern illumination. Two 100 watt Mazda lamps are used in diffusing enclosing globes 10 feet above the floor on 10 foot centers. The distribution of light is uniform,

the illumination level adequate, the room neat and attractive and quite a contrast to the old style shop with its multiplicity of drop cords and glaring lamps.

Some time ago the United States Public Health Service and the Post Office Department ran an elaborate series of tests checking up the question of the effect of different levels of illumination on the speed of sorting mail and found that if a certain speed was obtained under a 3 foot-candle level, by increasing this to 10 foot-candles between 20 to 25 per cent more pieces could be sorted; increasing from 10 to 30 foot-candles a still further increase in speed was obtained. Nearly 40 per cent more pieces could be sorted under 30 foot-candles than under the illumination of 3 foot-candles. There is no question that increased illumination permits clear vision and work can be carried on with less fatigue.

To sum up the question of illumination in home, classroom and industry, it has been proved beyond a doubt that adequate illumination does affect visual acuity; that the foot-candle meter is a proficient means of ascertaining the amount of light present; and that with expert advice it is quite possible to secure illumination which is adequate, proper, and, at the same time, artistic.

With these advantages there is no reason why we may not hope for a growing realization of the necessity for higher standards of illumination, with the result of increased comfort at home, at school, and at work.

Conserving Vision in the Nursery School and in the Kindergarten*

Mildred Smith Chambers, R.N.

JUST as prevention of blindness in babies is started even before their birth through attention to the health of expectant mothers, so the conservation of vision among school children is started even before they enter school through careful attention to eyes in nurseries and kindergartens.

IT IS perfectly understandable and probably has been most satisfactory that in the building of health programs all factors influencing personal health were not given equal consideration during the early, the pioneer, period. Weight, teeth, tonsils, give their evidence in a relatively concrete form. These, then, were the terms we heard most often during the beginnings of public health nursing.

With the remarkable interest and acceptance of the mental hygiene movement some physical factors have gained new importance due to their influence upon mental health. Of these, none shows a more definite relationship than the eye.

When we realize that in the process of body formation before birth, out from that which is to be known as a brain, two parts bud and push forward which are to become eyes, we better understand the definite influence that the eye may and does have upon mental health. Eyes are a part of the nervous system, a forward part of the brain, as it were. Fatigue or irritation in the eye will have an effect upon behavior in the wide variety of ways in which any nerve disturbance may evidence itself. Then, too, the imperfect eye may bring imperfect impressions and distorted mental pic-

* Presented at the Annual Conference of the National Society for the Prevention of Blindness, November 17, 1930.

tures will be formed; thus wrong conceptions may be gained and kept.

Today it is being more widely appreciated than ever before that all children, because they go through like processes, cannot develop like possibilities and successes. But each child can be, and ultimately will be, given the opportunity to develop the best that is within him physically and mentally. By the "best" we mean not only the ability to accomplish, but the ability to endure. One's period of happiness and usefulness should continue not only into middle life, but through late life as well.

The chance for endurance is largely determined by the foundation laid. Quality of materials will differ, but the wiser the use of any material the greater is the likelihood of satisfaction in the finished structure.

Such statements are so old that they have become trite; it seems a mere filling of space to use them again. Yet in discussion of eye hygiene, of vision conservation, we must even now—and probably will for some time to come—reiterate these old, obvious truths.

The appreciation of the importance of good foundations for health has concentrated attention upon the early periods of life in much of the health work these last few years. As it has been found wise to do this in the general field, so it is in each special field, and in eye work there is no exception. Sight conservation and prevention of blindness are begun with care during the prenatal period. All that is done to develop strength and stability must have its influence upon the eye as well as upon other organs of the body. Treatment against systemic infection may have its very definite result upon vision.

At the time of birth, one of the first considerations is the eye, and prophylactic drops are then instilled.

The newborn, we know, has to learn to see just as he must learn to walk, to talk, etc. At first there is only a consciousness of the difference between light and dark; later the two eyes, if evenly controlled by muscles, and the mind that in turn controls the muscles learn to work in unison—binocular vision is then developed. Even then the eye is not ready for the same type of work that would be suited to the adult eye. There is but little change in the

size of the eyeball, but together with this slight change there is a change in shape, which goes on during the early, formative years. During that period the eyeball is shorter from front to back than is normal for the finished eye, and the condition of hyperopia is present—"farsightedness" is not as good a term to be used in describing this condition, but it is the one better known to most of us.

Whatever term we may use, it is important that we have a partial understanding, at least, of the condition and what that means to the child. The hyperopic eye is not readily adjusted to near work, to fine detail—it is adjusted to the larger objects, to those not too close to the eye. The well meaning parents and teachers of the past, who not only encouraged, but often demanded, sewing and reading of the young child, did their share in allowing good vision to become poor, and poor vision to become poorer.

Today it is somewhat better appreciated that care of vision must be taken while that power is still developing. So it is that attention is being focused upon the pre-school child. Particularly where groups of children are brought together, there is growing concern regarding the environment which will allow them to maintain their best health, the direction of interests which will develop ability without strain, and the survey of physical and mental conditions made, so that as the child enters his more formal period of education he may be understood and therefore helped to make full use of that which we term "education."

The nursery school and kindergarten have the opportunity of doing much for the conservation of vision. Subjects relative to developing abilities and social reactions have been given special consideration in the preparatory courses of those who go into this type of work. Routine is more easily set aside and more individual attention given than is usually possible in the upper grade rooms. Generally there is a better proportion of staff to pupils than in other rooms of the public school. All these are factors which help to make it possible to give and receive very definite, practical help and information in relation to eye hygiene in the nursery schools and kindergartens.

The nursery school as a rule is open to children of 2, 3 and 4 years of age. In this type of school there is a new opportunity to study

children, to learn what may be expected of the average child under normal situations. A vision test here is quite as interesting from the viewpoint of psychological reaction, as is the determination of acuity of vision itself. Through work with faculty members of several nursery schools the value was learned of encouraging children to use both arms in free, definite movements when they are indicating the direction of the symbol exposed during the making of an acuity test.

It is better that a decision be made according to evidence than in order to win approval. We wonder if some of today's politicians, if given an acuity test as children, were not ones to keep their eyes upon the individual making the inspection, cautiously holding a hand in such position that it could be turned to meet approval and again turned if it seemed advantageous. Vision testing, as a process, involves not only physics, chemistry and physiology, but psychology.

In the kindergarten there should be an appreciation of the responsibility of preparing the child to enter school fitted to accomplish his learning easily and well. If it is true—and there seems no denial of it—that 80 per cent of learning is received through the eye, it is extremely important that the condition of the eye be such that true pictures may be readily and easily secured. It seems only reasonable that before entrance into school the state of the eye should be known. To be sure, correction does not always follow even when a defect is definitely diagnosed through medical examination. Yet without that, the child still has been benefited.

The misunderstood child cannot help but become a problem to himself and to others. If it is neither suspected nor known that he is working under a handicap, it is, of course, expected of him to accomplish the same results as the normal child, and with an equally good grace in doing so. To know, or even to suspect, a handicap certainly should mean a better understanding and therefore a more sympathetic and wiser handling of the child.

As in any health problem, eye care presents one in which maintenance of that which is good, prevention of further damage where some has already occurred, and correction of defect, are all to be considered. With an understanding of vision development and

the work involved in the process of seeing, sight conservation before, during and after the school period will be given not only greater, but more practical, consideration than is now generally true.

Intelligent observation of the child's behavior and of the appearance of the eye itself can bring to attention many cases in need of examination and correction. However, individual study of the child is also needed.

For an acuity test we must first secure proper equipment. By "proper" we do not mean expensive. The Snellen E chart seems the one giving the best satisfaction; the child can use it readily and it allows for the same type of record form that will be used in later tests. A good Snellen E chart will be one with accurately sized, sharply defined symbols in dense black, with sufficient space between them.

Artificial illumination is essential so that data secured will not only be accurate, but comparable from time to time. Light directed to one side and to the front of the chart allows an easy use of large cover cards which are used to expose one symbol at a time. Such cards cover all that is not to be seen, thereby concentrating attention on that which is to be seen, which means a saving of time for any age, probably, and certainly avoids confusion with the little child. It has the advantage, too, of somewhat destroying sense of location, thereby making it less easy for the person being tested to memorize.

A 60 watt daylight bulb, backed by an ordinary aluminum painted reflector, will give more than sufficient light for accurate results. The chart should be at approximate eye level. A 20 foot distance between chart and child is desirable; whatever the distance, it should be accurately measured.

Of equal importance with the equipment is the child. The child simply is not present if we have not secured his active interest, therefore his co-operation. Since seeing is a matter of the mind quite as much as of the eye, the mind must be open, ready to receive that which is brought to it. That this is true is often proved during embarrassment, sorrow, anger, during which we may fail to see that which is perfectly apparent normally. The eye under these conditions is still doing its work faithfully and well; it is the mind that is not responding.

Our method and our manner in using that method must be such that the child feels at ease. The adult should adjust to the child, not ask the child to adjust to him. Time is required to acquaint the child thoroughly with that which he is expected to do. Time must be taken to put him at his ease. One child responds to one manner—another to another. In this lies the art of vision testing: the opportunity to observe and carry out points in child psychology.

In making a vision test as part of a health inspection it is an approximation of the normal condition that is being looked for. The nurse and the teacher can know—relatively well, certainly well enough—the signs of health. If, in inspection, some of those signs are absent, we are aware of that absence and refer the child to one who has studied the negative, the physician, to determine whether or not there is a defect, and if so, what should be done. In observing for normality, we think in terms not only of accurate vision, but of easy vision. We are therefore interested in behavior as well as in a correct reading of the symbols. We know the appearance of the healthy eye. If there is variation from that there should be examination to determine the cause. Many serious errors in refraction have been picked up by interest in abnormal appearance of the eye, where acuity, as tested with a chart, seemed perfect. Eyes should function together, that we know. If fusion does not seem good, medical examination should be made.

If sight is poor or is accomplished with difficulty, it is important that either or both should be discovered early. Today that is not difficult; it is a matter of understanding children and of informing ourselves as to what response may be expected during these early years of life.

The question continually arises as to who is to make the vision test; particularly acute is this question where young children are concerned, for at their age time becomes an even greater factor than when older children are being tested.

In the matter of vision testing, we find that in some organizations only the doctors make vision tests as well as eye inspections. In other set-ups the nurse makes the vision test, screening out to the doctor. In still others the teacher screens out to the nurse, the nurse then screening out to the doctor. The latter seems the policy

most in favor, taking the country as a whole at this time. Whoever makes the test needs knowledge of the fundamentals in accurate vision testing and practice in doing so. In questioning ophthalmologists, I have found the consensus of opinion is that knowledge of children rather than knowledge of the eye, is the essential factor in success in securing an accurate acuity test from a young child. To them it seems satisfactory to have the teacher do the preliminary testing, if the official health and education agencies approve, and if the teacher's time is so arranged that she can include such testing as a regular, expected part of her program, not an added duty done under protest.

The pre-school age is one of peculiar interest in the conservation of vision and prevention of blindness. This is not caused by a high percentage of defects, for rather the reverse is true, but because this is an age of rapid growth in which strain may readily occur. To develop ability without strain, to build for endurance, are of prime importance. In these efforts we must not overlook the physical surroundings provided in nursery schools and kindergartens. In addition to the necessity for light-colored walls and ceilings, furniture in dull finish, and proper window shades permitting light but no glare, special attention should be given to the provision of adequate illumination without glare. Today it is quite possible and convenient to secure the services of an illuminating engineer to determine the best lighting arrangement.

The nursery school and kindergarten are in position to aid materially not only in the care of the child's eyes, but in the collection of information regarding the normal eye, and through both these ways to help in the big and important field of conservation of vision and prevention of blindness.

Contributors to This Issue

Dr. William H. Luedde is professor of ophthalmology of the School of Medicine, St. Louis University. For years he has been a member of the Advisory Committee of the National Society for the Prevention of Blindness and a director of prevention of blindness, St. Louis Society for the Blind.

As professor of ophthalmology of Harvard Medical School and as surgeon at Massachusetts Eye and Ear Infirmary, **Dr. George S. Derby** has long been interested in social service in eye hospitals, and as a director of the National Society has stimulated interest in co-operative effort in developing such service.

Mr. A. L. Powell is the manager of the Eastern Office, Nela Park Engineering Department, General Electric Company. As indicated by his recent address before the National Society and by his lighting demonstrations at the lighting laboratory in Harrison, N. J., Mr. Powell is well qualified to tell any one in private, public or industrial life "what's what" about lighting.

It is as Miss Mildred Smith, R.N., that **Mrs. Mildred Smith Chambers** is more familiarly known to health departments and kindergartens throughout the United States. Formerly educational agent of the Minnesota State Department of Health, she was appointed director of nursing activities of the National Society in 1928, serving until her marriage, late in 1930.

In the social hygiene movement there is perhaps no one better known than **Dr. William F. Snow,** whose name is affiliated with many and varied public health movements. Dr. Snow is general director of the American Social Hygiene Association as well as president of the National Health Council.

Among our Book Reviewers: **Dr. William H. Wilmer** is ophthalmologist-in-chief, Johns Hopkins Hospital, Baltimore; **Dr. Park Lewis,** of Buffalo, is vice-president of the International Association for the Prevention of Blindness, as well as of the National Society; **Miss Roma Gans** is assistant in elementary education, Teachers College, Columbia University; **Dr. Colman W. Cutler** is a member of the Board of Directors of the National Society; **Dr. S. H. Monson** is oculist for the sight-saving classes of the Cleveland public schools.

Unsigned or initialed articles or book reviews appearing in the SIGHT-SAVING REVIEW are prepared by staff members of the National Society for the Prevention of Blindness.

Editorials

The Sight-Saving Review in the War on Blindness

IN OUR relentless war on blindness we are adding one more powerful machine, THE SIGHT-SAVING REVIEW, to our ammunition. For sixteen years as a national organization, and before that for seven years as a state organization, we have tried to leave no effort undone to save sight and reduce the incidence of blindness. The undertaking of a quarterly magazine is a thoroughly considered project, coming as a result of several years of evaluation of the educational needs in the prevention of blindness movement.

For years the *News Letter* has attempted to serve both popular and technical groups. It has gone far afield of its original use to serve as a real news letter to the members of the National Society. In the past few years it has taken on more and more signed articles by experts in the various fields of prevention of blindness. While increasing its service to those definitely engaged in conservation of vision work, however, it has not been found sufficiently adequate for this group, as this SIGHT-SAVING REVIEW is designed to be. This REVIEW, in fact, is designed specifically to meet the needs of state and local prevention of blindness workers, educators, illuminating engineers, school physicians and nurses, safety engineers, public health administrators, industrial physicians and nurses, sight-saving class teachers and supervisors, ophthalmologists, and any one interested in the sociologic aspects of saving sight.

Some of the advantages seen in publishing such information in a quarterly rather than as occasional pamphlets are that: (1) it maintains a continuous interest on the part of the recipient; (2) it provides a diversified education for the recipient, as each issue contains a variety of material; (3) it serves as a developmental education for the reader, since a pamphlet is likely to be regarded as the record of a finished project, while the material in a periodical has the quality of continuity; and (4) it permits of a consecutive filing to form a continuous source of information on the subject.

In considering the usefulness of a new journal, the National Society has not overlooked the importance of a well-rounded editorial board, and is fortunate in securing the volunteer services of men and women eminent in their respective fields. Although a "who's who" is hardly necessary for this group, it is included to indicate the variety of fields the interests of this REVIEW cover:

Mary Beard, R.N., Assistant Director, International Health Division, Rockefeller Foundation

E. V. L. Brown, M.D., Professor of Ophthalmology, Rush Medical College

A. J. Chesley, M.D., Health Commissioner of the State of Minnesota

Charles L. Close, Manager, Bureau of Safety, Sanitation, and Welfare, U. S. Steel Corporation

Gladys Dunlop, Supervisor of Braille and Sight-Saving Classes of Detroit

Mary V. Hun, Chairman, New York State Commission for the Blind

Edward Jackson, M.D., Emeritus Professor of Ophthalmology, School of Medicine, University of Colorado

Albert B. Meredith, Professor of Education, New York University

A. L. Powell, Manager, Eastern Office, Nela Park Engineering Department, General Electric Company

C. O. Sappington, M.D., Director, Industrial Health Division, National Safety Council

William F. Snow, M.D., General Director, American Social Hygiene Association

William H. Wilmer, M.D., Director, Wilmer Ophthalmological Institute, Johns Hopkins University

Thomas D. Wood, M.D., Professor of Health Education, Teachers College, Columbia University

L. H. C.

The Eye and the Venereal Diseases

Any group interested in the conservation of eyesight must weigh seriously the rôle of the "venereal diseases" in the production of partial or total blindness. Gonococcus infection, in the form of ophthalmia neonatorum, and syphilis, congenital or acquired in later life, each takes its toll in blindness and impaired vision. Probably 15 per cent of all blindness is due to syphilis, and at least another 4 to 5 per cent is the result of gonorrheal infection of the eyes of the newborn. In other words, the venereal diseases are still responsible for practically one out of five cases of total blindness. In addition there are the numerous cases of partially disabling eye conditions due to these diseases. Conservative estimates show that at one time or another in the course of their disease 25 to 35 per cent of syphilitic persons may develop lesions of the eye or its associated nervous mechanisms. Certain groups of the congenital syphilis cases studied have shown an incidence of eye involvement as high as 78 per cent. The most frequent syphilitic lesion, interstitial keratitis, has been found to involve the cornea in as high as 60 per cent of such cases in some studies.

Such facts are not new to most of those specially interested in preventive medicine, and much has been done to bring them to the thoughtful attention of the general public in such a way as to avoid unreasoning fear of these diseases, while stimulating intelligent and sympathetic programs for combating them. Their mere recognition, however, is not a goal, but a basis for further study of how to safeguard human eyesight from these dangers in the future. We have, on the one hand, a group of children just beginning life, handicapped in infancy or in their formative childhood years, doomed by disease and defective eyes to an existence of decreased activity and usefulness, economic and social, or perhaps to complete dependence. On the other hand, we have apparently sound adults in a full career of work and responsibility, unexpectedly barred from continuing these activities because of failing eyesight, due to an undiscovered syphilis, or perhaps the all too frequent result of an inadequately treated old infection.

The efforts of ophthalmologists, the enforcement of laws requiring prophylactic treatment of eyes of the newborn, and the

reporting of cases of ophthalmia by physicians and midwives have done much to reduce the amount of blindness due to gonococcal infection. Among persons admitted to schools for the blind ophthalmia neonatorum as a cause of blindness decreased from an average of 16.5 per cent in the period 1918–1922 to approximately 9.2 per cent in 1930. Sixty per cent of these cases were due to gonorrhea. Similarly early effective treatment of syphilis and prevention of congenital syphilis have doubtless helped to save a great many threatened eyes. Such measures are very important, but in the last analysis the prevention of eye infections due to syphilis or gonorrhea depends largely on reducing the prevalence and opportunities for transmission of these diseases in the general population. So the problem resolves itself into a series of interrelated obligations: (1) On the part of the ophthalmologists to accept leadership in promoting vigilance in detecting syphilis or gonococcus infection as a factor in eye conditions; (2) on the part of the medical profession generally and health officials, to locate and provide medical care for exposed and infected persons; (3) on the part of legal and protective organizations to reduce the number of cases by eliminating environmental and other contributory factors; (4) on the part of educational and religious agencies to diffuse knowledge and build character as long-term factors in this great medical-social battle of preventive medicine.

WILLIAM F. SNOW, M.D.

National Society Notes

MR. LEWIS H. CARRIS, managing director, was in New Orleans, Louisiana, January 15–17, to discuss final plans for the sight-saving courses to be given at Tulane University this summer. Mr. Carris attended the sixty-first annual meeting of the National Education Association in Detroit, Michigan, February 22–26.

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On February 17 Mrs. Winifred Hathaway, associate director, gave a lecture on "Sight-Saving Classes" before physicians and nurses in Bridgeport, Connecticut, under the auspices of the Board of Health. As chairman of the program committee she participated in the meeting of the International Council for the Education of Exceptional Children held in Cleveland February 19–21. Mrs. Hathaway also attended the sixty-first annual meeting of the National Education Association, Detroit, Michigan, February 22–26. As staff member especially interested in the effect of lighting on the eyes, she was named representative on the sectional committee of the Safety Code for the Lighting of School Buildings, of the American Standards Association.

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Recent activities of B. Franklin Royer, M.D., medical director, include a radio talk over station WRNY January 30 on the subject of "Care of the Eyes in Measles." At the invitation of the Department of Health of Syracuse, New York, on February 19, Dr. Royer addressed a group of teachers on sight conservation. In connection with the planning of a Week for the Blind, Dr. Royer was called upon by the Georgia Association for the Blind to assist in prevention of blindness features.

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Miss C. Edith Kerby, statistician, spent January 12–21 in Detroit, Michigan, where she consulted with B. W. Carey, M.D., and others of the Children's Fund of Michigan in reference to records of examinations of rural school children of Newago and Lake Counties, Michigan.

Mr. Louis Resnick, director of industrial relations, addressed a meeting of the Delaware Safety Council, Wilmington, Delaware, February 24, on "The Eye Protection and Conservation Phases of the Safety Movement."

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Demonstrations of pre-school eye testing were given by Miss Mary Emma Smith, R.N., director of nursing activities, at the Massachusetts Eye and Ear Infirmary, Boston, Massachusetts. Similar demonstrations were given at Plattsburg, New York, in co-operation with the New York State Commission for the Blind. In addition, plans are on foot for a state-wide program of pre-school eye testing demonstration in co-operation with the Louisiana Society for the Prevention of Blindness.

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Through co-operation of the Press Division of the Foreign Language Information Service, articles prepared by staff members of the National Society have been published in a number of foreign language publications. One dealing with "Eye Hazards in Industrial Occupations" appeared in newspapers published in Finnish, Slovene, Croatian, German, Jewish, Lithuanian, Russian and Ukrainian; one on "Eye Glasses and Eyestrain" appeared in newspapers published in Finnish, German, Italian, Jewish, Russian, Ukrainian, Norwegian and Swedish; and one on "First Aid for Eye Injuries" was published in five different languages. Other articles discussing topics related to conservation of vision were sent out in various languages.

Note and Comment

National Society for the Prevention of Blindness in New Quarters.—In keeping with the advances of its work, the National Society will take up new quarters on April first in the Nelson Towers Building, 450 Seventh Avenue, together with nine other health agencies and a number of welfare organizations. The move was effected by the National Health Council, whose membership consists of: The American Child Health Association; American Heart Association; American Public Health Association; American Social Hygiene Association; National Committee for Mental Hygiene; National Organization for Public Health Nursing; National Society for the Prevention of Blindness; National Tuberculosis Association; and Foundation for Positive Health. The housing of so many agencies with common interests under one roof has resulted, in the past, in economies of expenditures, time and efforts; and added advantages are expected to be secured from this latest venture.

Annual Meeting of the International Association for Prevention of Blindness.—In its second year of life now, the International Association for Prevention of Blindness (*L'Association Internationale de Prophylaxie de la Cécité*) continues to grow steadily, though slowly, and gives evidence of its importance as a clearing house of information and as a stimulus to organizations or individuals throughout the world who are devoted to the same cause. Despite a lack of funds and only part-time personnel, the Association has reached out in a number of significant directions from its secretariat, No. 2, Avenue Velasquez, Paris, where the work is carried forward so ably by Dr. F. Humbert, secretary-general, and his assistant, Dr. A. Churchill.

An opportunity to review the Association's activities from both administrative and scientific aspects was afforded at the annual meeting of its Board of Governors at the Palais des Académies in Brussels, Belgium, Oct. 10, 1930. The American National Society for the Prevention of Blindness was represented by Mr. Lewis H.

Carris, managing director, who is also the United States correspondent of the International Association. The chairman of the meeting was Prof. F. de Lapersonne, the president.

Among others in attendance were representatives of the League of Nations, Dr. Pantaleoni and Dr. Josephus Jitta; representatives of the International Ophthalmological Congress, Prof. Van der Hoeve, president, and Dr. Marx, secretary; the secretary-general of the International League Against Trachoma, Dr. Wibaut; and the president of the All India Blind Relief Association, Mr. C. J. Henderson. Because of the concurrent meeting of the League of Red Cross Societies, a number of national Red Cross bodies sent delegates. Three instances of valuable co-operation with other organizations interested in conservation of vision were related by Prof. de Lapersonne in his address. These are:

(1) Collaboration with the Child Welfare Committee of the League of Nations in preparation of a report on sight-saving classes. Dr. Humbert, who is a member of this committee as the official representative of the League of Red Cross Societies, in which he is chief of the Health Section, will prepare the report.

(2) Assistance to the General Committee of French Insurance Companies in an investigation of the causes of industrial eye diseases and eye accidents in factories throughout France. The study was made by Prof. de Lapersonne over a period of six months and includes statistics gathered in 2,000 French plants.

(3) Co-operation with the International League Against Trachoma in the universal search for the causative factor of this disease. Liaison is through Dr. Humbert and Dr. Park Lewis, vice-president of the Association for Prevention of Blindness, who are members of the League Against Trachoma.

Acknowledging the aid received by the Association from various quarters, Prof. de Lapersonne said: "We have been endeavoring to find people who are in sympathy with our work and who might help us. Indeed, many such people have spontaneously come to us, and we have been deeply moved by the tokens of approval and of support which we have received from different countries. I wish to make special mention of the valuable help which the National Society for the Prevention of Blindness of the United States has constantly given us. We beg its eminent representative, Mr. Lewis

H. Carris, who has come to Europe to attend our meeting, to express to his colleagues our sincere gratitude. During this difficult period of organization, the League of Red Cross Societies has given us a hospitality which we appreciate more and more every day."

On the basis of official census figures, said Prof. de Lapersonne, there are 2,500,000 blind people in the world, but that wherever careful inquiries have been made these figures have had to be doubled; thus, the correct number is approximately 5,000,000. The blind population of China, alone, is at least 500,000, with a population of about 5,000,000 who are blind in one eye. The situation in India is equally depressing; according to data collected by the All India Blind Relief Association, there are 1,500,000 totally blind persons and approximately 2,500,000 persons whose sight is seriously impaired.

In his report as secretary-general, Dr. Humbert stressed the vital need for extensive propaganda throughout the world as a means of bringing into existence separate bodies to engage in the special work of conserving vision. "With a few striking exceptions, as in the case of the United States," he said, "the prevention of blindness is nowhere represented by autonomous organizations. Propaganda, in a word, is the very heart of our problem. It is the idea on which I wish to close this statement."

The Association was formed at The Hague (Scheveningen) Sept. 14, 1929, on the eve of a world-wide economic crisis, Dr. Humbert pointed out, and it has therefore met with unforeseen financial obstacles. The Association is awaiting a more opportune time before addressing a widespread appeal for funds. The income from February, 1929, when the first contributions were accepted, until September 30, 1930, amounted to $2,445.87; the expenditures amounted to $2,397.28. "If one takes into account the hospitality given by the League of Red Cross Societies in its building in Paris and the personnel service rendered by staff members of the League and of the American National Society for the Prevention of Blindness, these figures would be three times higher," said Dr. Humbert.

After extending good wishes from America, Mr. Carris outlined the experience of workers for prevention of blindness in the United

States during the last twenty years. He stated that the American Society was pleased to place at the disposal of the International Association such technical assistance as it possessed.

Other addresses were made by Mr. Henderson, of the All India Blind Relief Association; Mr. Milsom, of the League of Red Cross Societies; and Dr. Lossouarn, vice-president of the League for the Prevention of Blindness in China. Mr. Milsom discussed plans for public education on care of the eyes through the medium of the 12,000,000 members of the Junior Red Cross in countries throughout the world. Mr. Henderson sketched the tremendous task that is waiting to be done in India, and Dr. Lossouarn drew a dark picture for China.

Hiram Woods, 1857–1931.—Word has been received of the death of Hiram Woods, M.D., of Baltimore, Maryland, January 15. Dr. Woods was active in work for the prevention of blindness long before the formal organization of the National Society and was a director of the Society since its beginning. He was for many years vice-president of the Maryland Society for the Prevention of Blindness and took a leading part in its activities. In tribute to their old associate and friend, the Executive Committee of the National Society for the Prevention of Blindness passed the following resolution:

"Today the National Society for the Prevention of Blindness, in executive session, pays tribute to one of its founders, Dr. Hiram Woods, who on January 15, 1931, after a long career of usefulness and inspiration, stepped over the threshold of life.

"When in 1909 Maryland, following the example of New York, established a Society for the Prevention of Blindness, it was without question that Hiram Woods, a man in the prime of life, even then an ophthalmologist of wide repute, should be one of its most active participants.

"In 1910, when the necessity of a national organization became evident, Hiram Woods, because of his experience, was appointed one of the committee which brought into existence the American Association for the Conservation of Vision, which, in 1915, was federated with the New York State Committee for the Prevention of Blindness to form the present national organization. Since the new body needed a strong, virile governing board, Hiram Woods

was made a director, not only because of his experience, but because he combined with the attributes of a gracious, Southern gentleman a fearlessness in saying what he thought and in acting what he felt.

"With head held high and shoulders erect, Hiram Woods marched forward. The National Society is grateful for the heritage of his good works."

Revised Industrial Lighting Code.—A revised "Code for Lighting Factories, Mills, and Other Work Places" has been approved by the American Standards Association, following its approval by the Illuminating Engineering Society. The code is intended as a guide for factory owners and operators in their efforts to improve lighting conditions in their factories, and also as a source of authoritative information for bodies preparing safety regulations. It contains sections on measurement of illumination, recommended levels of illumination, avoidance of glare, specifications of adequate wiring, locating switches, and a suggested minimum regulation to be established by state authorities.

First Windowless Factory Building.—Industry's first windowless factory building, entirely without daylight and embodying radically advanced ideas for the scientific creation of ideal light and other working conditions for employees, is to be constructed by the Simonds Saw and Steel Company, Fitchburg, Mass. The structure will cover nearly two city blocks and will have solid walls and roof punctuated by neither windows nor skylights. Elaborate systems will be installed for lighting, ventilation, and noise absorption through acoustical walls and ceilings and other means.

Plans for the plant are the result of exhaustive research accomplished with the aid of every resource of modern science. Biological and psychological studies have been made to determine the effects upon human efficiency of such factors of workshop environment as light, temperature, sounds, and color. One of the many innovations resulting from these studies will be orange-colored paint for the machines, to lift their visibility and help reduce accidents. Walls and ceiling will be blue, green and white. The lighting system will be arranged to supply ultra-violet rays.

The company's aim is to surround its workmen with conditions

found to be most ideally conducive to safety and health and to freedom from fatigue and nervous strain, with consequent better production. Experiments conducted by the company have indicated that an increase in efficiency by as much as 33 per cent may result from the new methods.

Illumination of the great building, with its five acres of floor space, will be accomplished by hundreds of 1,000 watt lamps. The lighting system will provide uniform light intensity, not possible in daylight factories dependent upon the cleanliness of windows or upon changing conditions of the weather.

In order to combat distracting noises in the plant, all heavy machines and drop hammers are to rest on cork pads isolated from the remainder of the floor. All air in the building will be changed every ten minutes.

Intensive Campaign Against Industrial Injuries.—The employment and safety director of the Reed and Prince Manufacturing Company, of Worcester, Massachusetts, reports on the accident prevention program adopted to eliminate eye injuries and back strains at the plant. A committee was formed to hold hearings on all eye accidents that required the services of a doctor, the safety engineer being appointed to investigate the minor injuries and to follow them up. The accident was discussed, the cause was ascertained, the responsibility for the accident placed, and measures adopted to prevent a recurrence. From these hearings came the following information as to causes of eye injuries: grinding without goggles; failure to keep out of line with cutting tools; failure to keep out of line when kicking on belt; failure to wear goggles while standing near grinding wheel; bringing face close to cutting tools without wearing goggles; failure to turn head when passing grinding wheel in use; allowing steel chips to accumulate around belt; rubbing eyes with dirty hands; failure to be careful when shaking steel chips out of rags; failure to protect other employees' eyes in the course of work. Employees were requested to wear goggles continually.

Current Articles of Interest

The Industrial Nurse in Gear with the Machinery for Human Adjustment, Violet H. Hodgson, R.N., *American Journal of Public Health*, December, 1930, published monthly by the American Public Health Association, New York. Discusses the counterpart situations in the machinery for human adjustment which result in a lessening of production and efficiency in helping the individual to make a satisfactory adaptation to his environment—loss of time in reporting problems to other agencies; unwillingness to co-operate, resulting in a clashing of interests; neglect of the routine procedures of reporting, which are the mechanics of co-operation; and unco-ordinated objectives. Co-ordination and proper sequence of all the gears in the community health machinery are essential in order to attain the maximum speed in making productive human adjustments with a minimum of friction and lost effort. The industrial nurse has a very real contribution to make to this process within and outside the plant, if she is "timed" to perform her part in "proper sequence" with all the other agencies.

The Blind Pensioners of Illinois, William H. Wilder, M.D., F.A.C.S., and Audrey M. Hayden, A.B., *American Journal of Ophthalmology*, January, 1931, published monthly by the Ophthalmic Publishing Company, Menasha, Wisconsin. Tables are given to show the causes of blindness among those on the blind pension roll of Illinois. The most prominent parts are played by opacities of the cornea, cataract, glaucoma, affections of the optic nerve, and trauma. The authors advocate a central commission for the blind in every state, such a commission to see that all applicants for the pension are properly examined by competent oculists, and the findings recorded. The examiner should be a man of approved skill holding the certificate of the American Board for Ophthalmic Examinations.

On Correlation of Glaucoma, Sex and Age, K. I. Tsykulenko, abstracted in the *American Journal of Ophthalmology*, January, 1931, published monthly by the Ophthalmic Publishing Company, Menasha, Wisconsin. Of the 60,977 patients treated in the Eye

Hospital of Odessa from 1904 to 1928, 1.54 per cent were affected with glaucoma. The frequency of glaucoma among women was 2.04 per cent and among men 1.06 per cent. The incidence of glaucoma among eye patients was prevalent between 40 and 70 years.

Conserving Industry's Eyesight, Don M. Campbell, M.D., L.R.C.S.(Edin.), *National Safety News*, December, 1930, published monthly by the National Safety Council, Chicago, Illinois. A program outlined for an industrial organization for prevention of eye accidents. The physical examiner takes the visual acuity of every prospective employee. Those with subnormal vision are put through a more thorough examination, including a history of eye defects, dark room examination, focal illumination, ophthalmoscopic examination, and refraction.

The result of such a procedure naturally places the applicants for employment in three main groups: First, those who have physical eye defects, such as scars on the cornea, cataracts, or some organic disease of the retina, choroid, or optic nerve. These men cannot be helped with glasses and cannot be employed. Second, those who have poor vision from birth, and whose eye condition cannot be cured, or whose vision cannot be brought up to the required standard by glasses. Third, those whose vision can be raised to, or in most cases above, the required standard by properly fitted glasses. To these is offered the opportunity of getting the needed glasses. They go to their work equipped to do it efficiently and safely.

A price is made to the job seekers for medical services and glasses; for that price the worker receives a complete diagnosis of refractive and eye condition by a trained eye doctor, and a pair of glasses carefully fitted.

Book Reviews

AFFECTIONS OF THE EYE IN GENERAL PRACTICE. By R. Lindsay Rea, M.D., F.R.C.S. Philadelphia: Lea & Febiger, 1930. 155 p.

The dedication of this volume to the general practitioner indicates its purpose and awakens an immediate interest.

The first seven chapters are devoted to the affections of the appendages of the eye and to the ocular structures themselves. Chapters are given on the subjects of refraction, squint, injuries, cataract and lesions of the orbit, respectively; one division is devoted to the eye in its relation to diseases of the nervous system, and another to the value of ocular symptoms in localizing lesions of the brain. The final chapter treats of the hygiene of the eyes from before birth to old age. This chapter is followed by a list of useful prescriptions of ointments, collyria, general tonics, etc.

The book contains 7 colored plates and 133 illustrations in black; but, together with the majority of small medical books, it suffers somewhat from its very brevity. For instance, not quite sufficient explanation has been given to the need of general hygiene and to the relation of tuberculosis to phlyctenular keratitis. Many observers of great experience will not agree with the author in the worthlessness of vaccines in gonorrheal conjunctivitis.

This book is not without a sense of humor in advising the student not to attempt to recognize the changes in the optic disk or in the pupil of an artificial eye. The reviewer has seen this attempted many times to the confusion of the student.

The small volume covers much ground in very little space and it should be of particular help to ophthalmic nurses. On the whole, the book accomplishes well its purpose of aiding the general physician and of affording quick reference for students of ophthalmology.

WILLIAM H. WILMER, M.D.

IS IT SAFE TO WORK?—A STUDY OF INDUSTRIAL ACCIDENTS. By Edison L. Bowers. New York: Houghton Mifflin Co., 1930. 225 p.

This book is essentially an analysis of workmen's compensation practices here and abroad and of their influence or failure to influence accident prevention.

Why is it, the author asks, that we, who have such a hatred for war, condone a continual battlefield in industry where the casualties exceed those of war? Why must so many workers be killed and injured when reliable authorities agree that 75 per cent or more of all accidents could be avoided? The answer, he says, lies chiefly in two facts: (1) that our workmen's compensation system is based on guesses rather than on facts; and (2) that our system of compensating injured workmen, and the dependents of industrial workers killed in accidents, fails to recognize adequately the value of the worker.

"Our thinking on injury prevention," Mr. Bowers points out, "has been colored by machine guards, safety bells and stop signs. These are only the visible tools by means of which the work is performed. The real motive power is the willingness to provide the tools. The engineering and educational ability is not lacking. It can effectively reduce the human hazards of industry if only given a chance. This opportunity, in some cases, has come at the employer's request; in others, compulsion seems necessary. This compulsion can be exercised by the state, by virtue of the fact that it determines compensation policies. If the government would move industry to practice safety, it must speak the language of industry. It must make its appeal felt from a business standpoint. That is, it must make the issue a financial one, expressed through the medium of costs. In short, safety must be made the counterpart of savings, and industrial casualties the cause of business losses."

The book is worthy of the attention of anyone seriously concerned with accident prevention, even though it does not fulfill the promise of its intriguing title and though the author falls into the common error of assuming that as soon as industry is thoroughly convinced that accident prevention pays it will proceed to do all that it can do to prevent accidents.

L. R.

LE TRACHÔME CONJONCTIVITE GRANULEUSE. By V. Morax and P. J. Petit. Paris: Jean Morax, 1929. 382 p.

This volume is well printed on good paper and illustrated by 5 unusually good plates in color, and 85 figures throughout the text. The senior author is an eminent ophthalmologist and the work appears most opportunely.

Among the special subjects considered at the International Congress of Ophthalmologists held at Amsterdam and the Hague in 1929, none received more consideration than trachoma. This is a pernicious form of granulation of the lining membrane of the eyelids and is one of the most common causes of defective sight and blindness throughout the world. The reports made at that time by De Grosz of Hungary, Maggiore of Italy, and others showed such a widespread incidence of this disease not only on the continent of Europe but even to a greater degree throughout Asia and Africa that, following the Congress, representatives of twenty-eight nations met and formed an organization for the control of this pestilence. Since then, two exceedingly valuable works have appeared, one by Cuénod and Natif of Tunis, where fifty per cent of the native population is affected, and the present volume. France has been particularly concerned with this disease as it has been so widely prevalent since the World War, both at home and in the colonies, that a League has been formed for its study and co-ordinated efforts are being made for its control. In all of these movements Professor Morax has been an active and efficient leader. From his wide experience and close observation he is enabled to speak with authority.

The authors very properly begin by giving an exact definition, as far as it can be given, of the disease. "We designate," they say, "by the term 'trachoma' or 'granular conjunctivitis,' a disease affecting the ocular mucous (or lining) membranes, extending to the cornea, the transparent front of the eyeball, and resulting in cicatricial changes." Experimentation confirms clinical observations that it is an infectious disease, transmissible in man and under special conditions to certain species of animals. The term coming from the Greek means a "roughness" which is produced on the inner tarsal surface, causing elevated excrescences. It seriously affects the sight by developing vascular alterations in the cornea

(pannus), incurving of the cartilaginous part of the lids, inturning of the lashes, etc. It is of slow progress and is resistant to treatment, taking months and even years before complete recovery can be effected and recurrences even then are frequent. These are the essential elements of diagnosis as up to the present time a specific pathological agent has not been isolated and there is no diagnostic serum that may be employed.

Following MacCallan, who had wide experience with trachoma in Egypt, the disease is divided into four grades determined by the stage to which it has advanced. It frequently passes unrecognized in infants, one or both of whose parents are affected. It not rarely happens that the child contracts one of the commoner conjunctival infections, and the mucous secretion leading to an examination discloses side by side with this infection a beginning trachoma. A period of incubation after the infection lasts from 7 to 10 days before evidence of the disease can be discovered. The earlier symptoms are those common to conjunctival inflammations, of moderate dread of light, feeling as of some foreign body in the eye and excessive flow of tears. Whenever irritative phenomena are present such as swelling of the lids, gumming of their edges, pain with a thick mucous or purulent discharge, a superimposed infection due to the Koch-Weeks' bacillus, the gonococcus or some other micro-organism will be found present.

The authors lay great stress on the methods of examining the eyes to find the trachomatous granulations. They are most commonly located, especially in beginning cases, in the retrotarsal folds. These are not exposed by merely inverting the lids, but with the eye turned downward as far as possible a Demarres elevator or a strabismus hook may be pressed on the upper portion of the everted lid and the entire fold thus brought into view. With thickened lids and sensitive eyes this is by no means always easy of execution and a few drops of a solution of cocaine hydrochloride or a subcutaneous injection of novocaine will greatly facilitate the operation. The authors discuss the difference in diagnosis in the various forms liable to be confused with trachoma—such as spring catarrh, acute and chronic folliculitis, conjunctivitis of the newborn with Prowazek inclusions, school and toxic folliculitis and that having a lacrimal, tuberculous or syphilitic origin.

Various serological diagnostic measures have been tried, but none with sufficient success to be generally accepted. Much care has been given to the subject of treatment. This is considered according to chemical, physical, biological, and mechanical methods, and by inoculation of virulent substances or substances causing inflammation. The operative measures are given very completely. Grattage is not condemned as vigorously as it has been by some of the Italian writers. From a medical point of view the chapter on pathological anatomy will be of value.

A most interesting chapter is that on the origin of the disease.

The early statistics of Swan M. Burnett would indicate that the Negro in America is relatively immune, but it is common to the race in Constantinople and is exceedingly prevalent among the blacks in Northeastern Africa. No distinctions are noted of susceptibility of sex or race or because of meteorological conditions. It is a well observed fact that trachoma prevails where opportunities exist for its diffusion. It is a contagious malady, and without our knowledge of how it is propagated it goes everywhere and is founded on lack of cleanliness, neglect of individual and collective hygiene and an absence of those precautions that would prevent contagion, such as the common use of toilet articles and the failure to disinfect the hands by frequent washing. Promiscuity also favors the development of trachoma because individuals are brought more closely in contact under the worst hygienic conditions. Many authors have noted the fact that the disease is found in its most aggravated form among those who spend most of their time within doors while the proportion is relatively small among those who lead an outside life even while living in the same house. This is also true of those in the barracks of soldiers as well as of workmen gathered under the same roof. Aside from the fact of crowding the element of contagion is a prime factor.

In the countries in which trachoma prevails children are almost always infected before arriving at school age. Almost invariably when a young child is found with trachomatous eyes some of the near relatives will also be found to be affected.

The customs common in many countries make contagion easily effected. Among the Arabs the application of kohl to the eyelids which is drawn along the lashes readily carries the infection when,

as frequently happens, the same substance is used on the lids of the child. In certain instances trachoma is transported *en masse*, when populations are transferred from localities in which it is prevalent to regions in which it had been infrequent or absent before. This has been specially noted in Argentina, in Syria and in sections of Western Africa.

The authors very properly urge an organized effort to prevent the transfer of trachoma across boundary lines. Such regulations are up to the present far too limited.

A complete résumé of the experimental researches that have been made on the lower animals with a view of segregating the infective element leads to the conclusion that the Bacterium granulosis, a micro-organism not recognized before the studies of Noguchi, does not constitute the specific agent in the transmission of the disease.

Historically the subject is of great interest. Humanity has been a victim of this disease from the most ancient times. It was known to the Greeks; Herodotus, fifth century B. C., says that soldiers were withdrawn at Thermopylae because of it. Aristophanes refers to it in "The Frogs." Hippocrates recognized it, and Paul suffered from it. Among the Romans, Cicero, Horace and Pliny the Younger all were trachomatous and down through the ages frequent references are made to it. The sanitary history of Napoleon's campaigns as affecting ophthalmia is most instructive. He took 35,000 men into Egypt, sanitary regulations of today then being unknown. At Cairo an acute epidemic of pest and dysentery carried off large numbers of soldiers. Ophthalmia also appeared. It did not seem to be severe and almost ceased but at Alexandria it reappeared with new intensity and 3,000 men were attacked. Before long two-thirds of the troops became affected and an ophthalmic hospital was established at Cairo. The English, Italian and Prussian armies suffered even more. Wherever the troops went—Malta, Sicily, Gibraltar, Portugal, Spain—the contagion was carried. In Great Britain it was most severe. In one regiment of 700 men in a single year 636 were attacked. On the Baltic were infected centers. After the battle of Waterloo it appeared to cease but in 1818 it reappeared with renewed virulence. In 1823 it had extensively invaded Russia. Up to the fifteenth

century there is reason to believe that Egypt was no more generally infected than other countries on the Mediterranean littoral. It was widely spread without doubt by the knights returning from the various crusades. Today its existence is so extensive in various parts of the world that its control becomes not only a humanitarian but an economic necessity. In Egypt in 63 nursing children Morax found 14, or 22 per cent, with trachoma and his investigations warranted the conclusion that 93 per cent of the inhabitants were affected.

Howard, who lived many years in China, concluded that trachoma in that country caused greater economic losses than famine and flood combined. In a single village in Japan 91 per cent of the inhabitants were trachomatous. De Grosz has shown that Hungary is the first country that has made a methodic effort to control this disease.

Especially important are the authors' suggestions in regard to prophylaxis. Measures to be employed in the home, in the school, in the army and in other places where numbers are gathered together demand organized supervision together with the legislative measures that should be enacted. The chapter on "Prevention" is equally valuable.

The wide experience of the writers, the accumulation of careful observations together with their judicious advice as to protective and curative measures make this work one of the most valuable contributions that has appeared on this important subject.

PARK LEWIS, M.D.

TEACHING THE CHILD TO READ. By Samuel W. Patterson. New York: Doubleday, Doran, 1930. 524 p.

To those interested in the conservation of eyesight, a book on the elements of reading is important. Of special interest to them would be the chapter on "The Physiological Aspect of the Reading Process," and "The Hygienic Implications of the Physio-Psychological Aspects of the Reading Process." According to an inscription on the cover jacket, this volume, however, is "designed for basal use in teacher training institutions," and as such, falls somewhat short of expectation. There is a great need for a book

on the teaching of reading written expressly for the students in teacher training schools. One realizes the need for an effective presentation of the subject when one considers the large number of teachers who are being prepared to teach and who, for the next several decades, will influence and control the teaching of children to read.

This book, judged from the various aspects upon which the author touches, should be a comprehensive treatment of the subject. The hygienic aspects of reading, the general classroom conditions influencing the reader, and the importance of a meaningful background are topics which are frequently overlooked in a treatise on the subject of reading, but are included in Patterson's work. Stenographic reports of lessons illustrating procedures which are previously described are included and carefully planned exercises for students, designed to extend their study and research of the subject, follow each chapter. An extensive bibliography composed of several hundred titles on reading and on education in general is a commendable feature of the book. The bibliography is essential to the successful use of the exercises following the chapters.

While the general plan of the book is desirable, the author's treatment of the subject is not equally so. In his attempt to write simply enough for his student readers in teacher training institutions, he has resorted to generalities which diminish the usefulness of the volume. As example, on a topic as important as posture in reading, only an eight line discussion is given, concluding with: "Standing posture during oral reading should receive the consideration it deserves for it has a direct effect upon the pupils' speech." This is the only reference made to "standing posture" and to its relation to "speech." Such important topics as phonics, when to begin reading, and the pupils' social background, are similarly treated in an indefinite fashion.

Excellent ideas are stated but are not sufficiently elaborated to carry much significance to the reader. For example, reference is made to Dewey's statement concerning the postponement of beginning reading until the child is at least eight years of age. The author calls attention to this opinion of Dewey, but does not go into some of the major implications of this much mooted question.

Although "Teaching the Child to Read" is an attempt to show the principles underlying acceptable method, it is to be regretted, since it was written particularly for the teacher in training, that it is not more definite in its suggestions.

ROMA GANS

TRANSACTIONS OF THE INTERNATIONAL OPHTHALMOLOGICAL CONGRESS, HOLLAND, 1929. 4 vol.

The Thirteenth International Congress of Ophthalmologists was held at Amsterdam in September, 1929. It was the first international congress since the meeting held at Naples in 1909. The Twelfth Congress had been planned for 1914 at Petrograd, but the War intervened.

This memorable reunion of ophthalmologists was in response to a feeling that by a closer accord among scientific men an important contribution might be made to international friendship. This aim and its accomplishment are shown by the addresses of the President, Professor Van der Hoeve, and especially by the eloquent replies, among many others, of Treacher Collins, of London, and of Professor Axenfeld, of Freiburg, one of the most distinguished of the German colleagues, whose recent death has saddened all who knew and worked with him.

The Transactions of the Congress comprise four large volumes, from which it is possible to select but a few subjects for our present consideration.

The first volume contains clinical reports from many lands and in various tongues. In "Studies in Ocular Fatigue; Fatigue of Accommodation," by Dr. Conrad Berens and Elizabeth Stark, a tribute is paid to the untiring energy of Dr. Lucien Howe, who devised the accommodation convergence ergograph. A later paper by the same authors reaches the conclusion that accommodation is difficult to fatigue. Lancaster and Williams have found that "with continuous or sustained effort, the near point came steadily nearer, until in 10 or 15 minutes it was 50 per cent nearer than at the start (a phenomenon of viscosity). This seems to fit into the theory of accommodation advocated by Tscherning and others rather than that of Helmholtz and Hess and others."

"The Refraction Curve in the U. S. A., with Special Reference to Changes in the First Two Decades," by E. V. L. Brown and F. C. Kronfeld, of Chicago, is a contribution to a subject which is of general interest and is based on the study of 20,000 eyes, 42 per cent of which were thoroughly under atropin. In order to avoid extremes, cases between 8 D. hypermetropia and 6 D. myopia were chosen for the graph. This excludes so-called progressive or malignant myopia and offers a fair estimate of the refraction of school children.

The most common refraction is plus 1.00 D., but there is more progression toward the myopic side in the eyes of school children than anyone is conscious of at this time. The authors do not draw any conclusion as to the cause of this progression. According to their curves, it increases gradually from the age of seven to fourteen. After fourteen it drops almost suddenly, but shows a second rise from eighteen to twenty. They conclude that it is not due to work done at school, as this becomes more intense from twelve on, while the tendency to myopia is noticeably less; nor is it a pathological process, but rather "a growth phenomenon which practically every eye shows."

"Amblyopia in Squint," by Dr. Luther C. Peter, of Philadelphia, is a debatable subject presented in a manner which will be convincing to those who have held the views of Claud Worth of some years ago. Dr. Peter presents, with much else that is interesting, evidence regarding the transference of amblyopia to a covered eye and the restoration of normal vision in the formerly squinting eye. There is usually a small, relative scotoma in the squinting and amblyopic eye. Dr. Peter does not state whether the scotoma disappears after the improvement under orthoptic training, nor does he give the details of the treatment except to state that it is confined to an occlusive bandage. Concerning the cause of squint, after eliminating as contributing but not constant factors, accommodation, hypermetropia, muscular anomalies, fright, acute illness, etc., heredity, there is left only the inability of the eyes to fuse two objects into one, a defect of the "fusion faculty." The writer believes "that amblyopia can be prevented in a majority of young patients and that suitable training will restore normal or nearly normal vision in a majority of patients under seven, and that

improvement can be expected in much older patients." It is obvious that early treatment offers the best prospect of success and that the utmost co-operation among all concerned is needed.

One of the most striking contributions to the Congress was that of Professor J. Gonin, of Lausanne. It has been recognized that detachment of the retina is one of the diseases of the eye least amenable to treatment and most discouraging in its prognosis. For ten years Professor Gonin had demonstrated his method, but here the consensus of opinion was so general and the discussion so illuminating and favorable, that Gonin's method takes a place with the operations of Elliot and Lagrange which have saved many eyes afflicted with glaucoma, as a long stride in the road towards the conquest of blindness.

Professor Gonin's paper was entitled, "*Le Traitement Local du Décollement Retinien.*" Space does not permit the quotation of his lucid and convincing words. The principle rests on the discovery of a tear in the retina, which may be difficult, but the tear or rupture is believed by Gonin to be always present, and is the cause of the detachment, in that it permits the vitreous to pass into the retro-retinal space. When the rupture has been localized by the ophthalmoscope, a small thermocautery is passed through the sclera and the scar thus formed closes the rupture and the retina is attached to the choroid. His observations may be summed up as follows: (1) In all cases of recent detachment where the closure of the tear or tears has been accomplished with certainty, the cure has been immediate and complete without the intervention of any other treatment. (2) In every case where the detachment persists, a careful search has shown that the tear which had been seen had not been closed by the cautery, or that there existed another tear not previously recognized. (3) In a few cases where there has been a relapse, the explanation has been found in the formation of a new tear or rupture.

An extensive article by Dr. Arruga of Barcelona, with excellent colored plates showing the existence of tears in different parts of the retina, and the scars after their closure, adds weight to Professor Gonin's statement.

With regard to the extraction of cataract, the tendency of the Congress, as shown by numerous opinions, was toward extraction

in the capsule as the operation of the future. Professor Elschnig (Prague) sums up from a large experience, and after having tried the Smith method of extraction in the capsule and the suction method of Barraquer of Barcelona, he has for the past four years practiced a method known as the Stanculeanu-Knapp operation, with which results are better as regards the welfare of the eye and ultimate vision.

It would be very interesting to give abstracts of the numerous papers on glaucoma. In addition to numerous contributions on operative variations, all tending toward an establishment of the filtration principle with minor modifications of the Elliot-Lagrange technique, an especial section was devoted to the pathology and medical treatment of the disease. Magitot (Paris) indicates many factors, constitutional, toxic, chemical, nervous, all acting as possible causes of edema (which is a condition itself requiring definition), and reaches the obvious conclusion that glaucoma is a symptom of a general disease, a sick eye in a sick body, as Lagrange has said. The treatment of the general cause must be regarded as a large medical problem. Operation is indicated only in acute or in painful glaucoma, the author states. Later, in discussion of the subject it was emphasized that precious time should not be lost by palliative or medical treatment where the optic nerve was suffering through the continuous or intermittent tension.

S. Hagen (Oslo) treats with commendable clarity the mechanics of tension. The relation between the channel of escape and the variations in the contents of the eye, either through the filling of the intra-ocular blood vessels or the other fluid contents of the eye, and the influences that may affect these relations, are studied by a series of daily tension curves, the observations based on tension taken during day and night, under the influence of myotics, also of adrenalin, to which is given an especial value attributable to its contractile action on the vessels and a diminished secretion of aqueous humor, due, according to Seidel, to a toxic action on the ciliary epithelium.

From the clinical standpoint the pathogenesis of glaucoma is not to be explained by any single theory. It is hoped by the author that the experience of recent years, as regards significance of the sympathetic nervous system, the relation of certain hormones and

other substances produced by the body on the ocular tension, may in this manner (that is, by the study of constant tension curves) be productive of some result.

This subject, "The Etiology and Non-Operative Treatment of Glaucoma," is continued by W. S. Duke-Elder (London) in a scholarly study of the physiological bases of the problem, of which the pathological processes are merely aberrations. Such an essay does not lend itself to an abstract in this place, but the work that is being done is immensely stimulating. The author's final conclusion is: "Surgical treatment is merely palliative of the symptoms of tension and does not cure the disease; but in our present ignorance of the ultimate etiology, medical treatment, although it can do much, cannot yet justifiably replace it in the majority of cases."

In the final paper in this symposium on glaucoma, by Professor K. Wessely (Munich), the pendulum swings to the clinical side, and after a discussion of various myotics and their action, and of several of the newer remedies such as glaucosan and adrenalin he states, "The modern efforts for the extension of the medicamental therapy of glaucoma, though perfectly justifiable in themselves, may on no account oust our operative experiences and successes, nor may they, by increasing the patient's fear for an operation, or by rating the doctor's responsibility for the operation too high, cause the right moment for promising operative intervention to pass by unutilized, as is but too often the case when myotics have been used too long. For such neglect would have one of the most serious consequences which we must keep in mind in discussing our subject."

A separate section, somewhat extensive but not conclusive, is devoted to trachoma and will be reviewed in a later issue of THE SIGHT-SAVING REVIEW, as will also certain reports on the standardization of visual examination, perimetry and color tests.

COLMAN W. CUTLER, M.D.

TEN YEARS OF WORLD CO-OPERATION. Foreword by Sir Eric Drummond. League of Nations, 1930. 467 p.

The Health Organization of the League of Nations is interested in the various phases of prevention of blindness which have an international aspect. Among other things, the Health Organization has issued a report on trachoma by Dr. Josephus Jitta and Dr. Albert Lutrario. In "Ten Years of World Co-operation," a comprehensive volume just published by the League Secretariat in Geneva, it is pointed out that trachoma "is of considerable significance from an international standpoint, because of the world-wide distribution and because of the restrictive measures against immigration which some countries have been obliged to take on that account." The summary of the League's activities also refers to the study on the welfare of the blind and the prevention of blindness made in 1928.

D. R.

YOUR VISION AND HOW TO KEEP IT. By H. G. Merrill and L. W. Oakes. New York: Putnam & Company, 1930. 145 p.

This is written in a simple direct style, primarily for teachers and nurses and those of the laity who may be interested in the general care of the eyes. The underlying anatomical facts are given in an interesting and easily understood manner and there are several simple diagrams.

The commoner diseases of the conjunctiva, cornea and iris, as well as those of the lens, choroid and retina, are explained, avoiding as far as possible technical terms. The early treatment of crossed-eyes is given special attention. Why we need glasses and their proper adjustment is taken up in detail and there is an excellent account of the effect of various drugs and poisons upon the eyes. The various theories of color-blindness are also discussed.

This book will be of value to any one interested in the care of the eyes and is especially recommended to teachers who have charge of sight-saving classes.

S. H. MONSON, M.D.

Briefer Comment

CAN WE GET RESULTS FROM EYE-STRAINING TYPOGRAPHY? Douglas C. McMurtrie. Chicago: Ludlow Typograph Company, 1929. 18 pages. Essentially prepared for advice to advertisers through printing. Author presents briefly the arguments for eliminating the use of six and eight point type no matter how carefully arranged, in deference to ten, twelve, and fourteen point type, which has been proven to be more legible and more quickly picked up by the eye and grasped by the mind.

A WORLD PANORAMA OF HEALTH EDUCATION. New York: American Child Health Association, 1930. 256 pages. This volume presents the discussions of the health section of the World Federation of Education Associations which took place in Geneva, Switzerland, in 1929. Among the resolutions relative to school health procedures, the following, which is number three, is of special interest to sight conservation workers: "That the Health Section recommends that publishers be encouraged, where this is not done, to bring out text books for children in large types in the interest of the eyesight of the pupils and that the size of the type be considered by educational authorities in accepting or rejecting the books."

PIONEERS OF PUBLIC HEALTH. M. E. M. Walker. New York: Macmillan Company, 1930. 270 pages. Popular presentation of the lives of twenty-one important contributors to the health and welfare of society, attractively printed and illustrated. One regrets that the series did not continue at least to the inclusion of Hideyo Noguchi, born 1876, whose work not only in yellow fever but in trachoma has started a new path in the solution of disease which has not only national but international significance.